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HANDWORK INSTRUCTION FOR BOYS

By DR. ALWIN PABST

Director of School for Training Teachers of Handwork
Leipsic, Germany

25141

Translated from the German

By BERTHA REED COFFMAN, A. M.

St. Louis, Missouri



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P 11

DEDICATED TO
E. VON SCHENCKENDORFF
MEMBER OF THE PRUSSIAN DIET AND VERY
DISTINGUISHED PRESIDENT OF THE
GERMAN SOCIETY FOR HAND-
WORK FOR BOYS.

TRANSLATOR'S PREFACE.

In translating this work I have endeavored to be as literal as possible without injury to the English. The clear, concise style of the author has made this easier to do than would be the case with many German writers.

For the convenience of English readers all technical terms have been translated, with the exception of a very few which have no English equivalent.

In America there is no institution which corresponds exactly to the *Volksschule*, *Bürgerschule*, *Gymnasium*, *Realschule*, *Seminar*, or *Hilfschule*.

The *Volksschule* (plural *Volksschulen*) is the elementary school of Germany. It differs from the public schools of America in several essentials. In the *Volksschule* every pupil must pay tuition unless he is too poor to do so. Another point of difference is that while the public schools of our country are attended by nearly every child of school age, the German *Volksschule* loses many children who prefer to attend other schools.

The *Bürgerschule* (plural *Bürgerschulen*) as its name indicates, is a school for the middle classes.

The *Gymnasium* (plural *Gymnasien*) has a course of nine years of classical work preparatory to the university, while the *Real-Gymnasium* prepares for advanced technical work in the *Technische Hochschule*, or technical college.

The *Realschule* (plural *Realschulen*) is a non-classical school offering a course of six years in mathematics, the

sciences and modern languages. This school corresponds to some extent to the American high school.

The term *Seminar* (plural *Seminare*) may mean a normal school for the training of teachers or it may refer, as in the American universities, to a special class organized for advanced study in any particular subject. Dr. Pabst uses the term with the former significance.

Under the term *Hilfschule* are included many kinds of institutions. In the beginning of the fourth chapter Dr. Pabst explains his use of the word, applying it to all institutions for the training of mentally defective children. It is also applied to reform schools.

It affords me pleasure to express at this time my appreciation of the assistance rendered by all who have aided in the preparation of this work. I wish especially to thank the author, who has taken an active interest in this American edition, furnishing the photographs and offering valuable suggestions, and Mr. Charles A. Bennett, who has read critically the entire manuscript and rendered valuable aid throughout the progress of the work.

McMILLAN HALL,
Washington University,
Saint Louis
November, 1909.

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INTRODUCTION.

The origin of the following work goes back to six lectures which, in compliance with an invitation from Professor Rein of Jena, were delivered before the summer school there in August, 1906.

I have consented with greater willingness to let these lectures appear in enlarged form because I am convinced that the question of instruction in handwork for boys is one of the most important problems which is under discussion at the present time. It lays claim to a universal interest, for to handwork, so often discussed with great vehemence, more than to any other branch of education, can the word of the poet Schiller be applied, *Von der Parteien Gunst und Hass verwirrt schwankt ihr Charakterbild in der Geschichte*. (Confused by the favor and hatred of parties, its image changes in history.)

In reality it concerns not simply a new branch of instruction, but a deep-rooted principle of our whole educational system. Therefore something further must be brought out if one is fully to comprehend handwork in its significance for education. The superficial way in which this question is frequently treated in meetings and by the press can lead to nothing but a war of words, at the end of which neither opponent convinces the other. To avoid the possibility of falling into this error, it has been necessary to bring together material from different fields of knowledge in a comprehensive and yet condensed form in order to establish the necessity of instruction in handwork.

The history of civilization teaches that the saying *Wissen ist Macht*¹ (knowledge is power) does not stand without modification. Knowledge in itself is not power, but it becomes power in the service of the will and understanding.

This acknowledgement is decisive in the examination of our present day education, and the discussion of the problems of education from this point of view leads us, as a matter of course, to the necessity of turning our attention also to other civilized countries. Scarcely a phase of intellectual life reflects the national character of a people so clearly as that of education!

The studies of school matters and systems of education which the author has had the opportunity to make in different European countries, and in North America, have contributed essentially to develop fundamental doctrines which are expressed in the book here presented. He who believes with the author that the kind of education given determines essentially what will result from the youth of a people in the future and how they will stand the test in the conflict of the ruling civilized peoples, will also admit that we must go back to the fundamental problems of our education and to the foundations of our civilization if we wish to secure a clear judgment in such a deep-rooted question as that of instruction in handwork for boys.

From this point of view the author would like to have the following work regarded as a contribution toward the solution of an important problem of education.

A. PABST.

Leipsic, Nov., 1906.

¹ Saint Chamberlain, *Die Grundlagen des XIX Jahrhunderts* (Foundations of the Nineteenth Century).

CHAPTER I.

INSTRUCTION IN HANDWORK BASED UPON THE HISTORY OF CIVILIZATION (SOCIOLOGICAL AND TECHNOLOGI- CAL), UPON PSYCHOLOGY, AND UPON THE DEMANDS OF TEACHING.

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Aristotle calls the human hand the "tool of tools," and it is really that in a threefold sense. In the first place, it is the natural tool given to man at birth; then it serves as a pattern for the artificially formed mechanical tools; and finally the construction of the latter, which are commonly called "hand tools," depends primarily upon its activity.

On account of its formation, by which it is wonderfully fitted for the most varied functions, the hand furnishes the model for all artificial tools. All the tools which were made by primitive man are evidently planned with the intention of reinforcing the activities practiced by the hand, and assume the form of a perfected human hand.

The stone with a wooden handle, for example, is the simplest artificial imitation of the forearm with the fist clenched, and all hammers and axes can be traced back to this fundamental form. The same form has remained almost unchanged even to the present time in the hammers of smiths and miners. Even the gigantic steam hammer still shows this fundamental form; and however great the contrast may be between this mighty tool of modern technique and the stone hammer of remote antiquity, yet there exists, without doubt, a certain connection between

the lines of thought of the designer of the steam hammer and those of the primitive man who used the first stone hammer.

The hammer experienced an important transformation when it was changed into the hatchet and ax by the formation of an edge; thereby not only its utility as a tool was increased, but its effectiveness for the purpose of defense as well. The incisors have evidently furnished the pattern for this transformation; in the same way the simple row of teeth on the file and saw are designed, while the hand in the act of grasping something and the teeth of the upper and lower jaws are copied in the head of the nippers and the jaws of the vise. In a similar way the knife and chisel point back to the incisor, and the gimlet to the extended index finger with the sharp nail. Hammer, hatchet, saw, pliers, knife, chisel and gimlet represent primitive tools, the invention and use of which marked the first step in a broader advancement of civilization for the primitive man, as we observe this even to-day in races which stopped at a lower stage of civilization.

The value of tools increased naturally with the use of different materials (wood, horn, bone, shells, stones of different degrees of hardness, and metal) which gave the tool greater strength and made possible a form better adapted to its purpose. Concerning these stages of development the history of primitive ages gives us information which teaches us that the iron age followed the stone and bronze ages, while the success of modern technics could be attained only through the use of the hardest steel. In the improvement of tools there have been only gradual changes, for the steam hammer in its fundamental form is just as much a hammer as one of stone, and in the same

y we may trace numerous other tools and implements back to certain fundamental forms which are suggested by the natural tools of man—the hand, arm, and teeth. The cup goes back to the hollow hand out of which we drink; the hook finds its origin in the bent finger; the lance is a prolongation of the arm, the strength of which is increased; and so it is with many other weapons and instruments which are used in the hunt, in catching fish, in agriculture, and in the working up of raw materials.

The improvement of all these tools, which in their original forms are primitive and incomplete, it was of great advantage that nature herself furnished in part the raw materials (thorns, teeth, and pieces of bone from animals, fire stones, etc.) and that through the use of fire hardening, hollowing out, sharpening and polishing of these materials were made possible.

These examples drawn from an inexhaustible supply of material may suffice to show the origin of the first tools and their significance in the further development of civilization; at any rate they give us some idea of the truth and meaning of the assertion of Edmund Reitlinger that “the history of man, if examined carefully, finally reveals itself in the history of the invention of better tools.”

In a similar way the machines and technical aids of our highly developed industry can be traced back to simple fundamental forms. The steam flour mill, for example, and the primitive flour mill of the first people are contrivances for grinding which have in common, as their essential element, the millstone which furnishes a more effective substitute for the molar teeth.

The tool constantly serves the purpose of giving to man a greater mastery over nature and her products. Through

the use of mechanical tools this mastery is remarkably increased and strengthened. Even the scientific instruments and apparatus are nothing but improved and refined tools, which are especially constructed to secure for us a more complete knowledge of the natural bodies and the powers of nature than would be possible for us with our senses alone. Just as the ordinary tools assist the hand, so the microscope and the telescope assist the eye, the telephone the ear, and the telegraph makes possible communication at great distance without change of place.

So man has gradually risen by means of the perfection of tools to higher stages of culture; he can rightly be regarded as the tool-using creature and in this respect is distinguished from all other creatures. But since the discovery and improvement of tools depends not alone upon intellectual activity, which, to be sure, cannot be spared, a further development of the hand must take place along with the perfection of the tools. The improved tool demands a more skillful hand, and in the same measure as the tool of the present differs from that of primitive times, the skill of our hand differs from that of the hand of the primitive man.

By the use of the tool the hand is not only trained, but it is protected as well. It is saved from coming in direct contact with hard material and has thus attained a greater delicacy, sensitiveness, and flexibility. Thus in mutual reaction the tool has aided the development of the natural organ. This in turn, after attaining a higher stage of skill, has brought about the perfection and development of the tool, and both factors have increased in power mutually until they have reached the highest attainments possible, as exemplified in the handwork and in the tool of

the operator, artist, or skilled mechanic. The latter, for example, who has to work with the finest instruments for measuring, can develop his hand into such a fine tool, that, in the testing and fitting of the draw tube of the microscope into its sheath, it can distinguish differences which cannot be measured by any tool.

The statement that the improved tool demands also an improved hand is clear without further explanation; its application to machine work may not be quite so self-evident in current opinion. Indeed, many are of the opinion that the machine which saves man from rough work and which performs even finer tasks with a precision which is not possible for the hand, especially in large quantities, makes a further development of the hand unnecessary, while it turns over to it only the work of assistance and takes from it, on the other hand, the real execution of the work. However, this conception is not correct, for a more careful examination shows that progress is possible in the use of machines only when it is united with a corresponding progress in the development of the people who use the machine. The uneducated workman, for example, who can use a simple agricultural instrument well would utterly fail in the use of the complicated machines of mechanical weaving. The more complicated the machine becomes, the better must be the training of the hand which uses it, and such a training of the hand is necessarily linked with greater executive power of the brain. When the fingers must work so accurately that they deal with differences of millimetres, such exactness is impossible without a corresponding training of the eye, and trained intellectual ability,—in other words, a higher executive power of the brain.

With reference to the use of scientific apparatus and of fine instruments for measuring, this is quite obvious; it applies, however, to every kind of mechanical and technical work as well. Nature has also provided that it should not be possible for a person to receive a wholly one-sided development for a particular service; if a particular service of the eye or hand is required from a person, the entire man must be developed to a certain power of achievement. Just as it is impossible to bring any particular part of a machine to perfection and develop in it great power of execution at the expense of the other parts which are left in their primitive form, there are also certain fundamental limitations in the development of the power of execution in single organs of man on account of their relation to other organs and their dependence upon them.

The preceding statements lead up to a discussion of the physiological - psychological principles of instruction in handwork with reference to the facts given in the preceding pages. As far as universal experience goes, the control of the groups of large muscles is easy. On the other hand the finer and finest perceptions of touch and motion of the arm, the hand, and especially the fingers are learned only with great pains. For example, it demands less skill to handle the ax and split wood with the exertion of all the hand and arm muscles than to take hold of a pen with three fingers and write with it. In his first attempt at writing, the child uses almost all the muscles of his whole body; and even among grown people we frequently notice that a movement of the muscles of the face accompanies the motion of the hand in writing. What we call rough work calls into activity the groups of large muscles with their coarser adjustment, while the finer work exercises

groups of small muscles with their more delicate adjustment. Therefore, the rougher work develops only a few of the crude motor functions, while the finer work develops the more exact motor functions and requires a finer adaptation of the movements of the muscles. This latter alone is educative, while the hardest kinds of handwork dull the motor perceptions. Not the ax and crow-bar, but the light hammer, saw, plane, chisel, knife, and scissors are the tools which ought to be used in the school for handwork. Hence it is also clear that the instruction in gymnastic activities does not suffice for the development of the motor perceptions, but their value in other respects is not affected by this fact.

The investigation into the development of the child has taught us that the training of the motor perceptions must begin early, for the brain centers which control the movements of the muscles of the hand develop early (according to Preyer the motions of grasp of the child can be clearly recognized in the seventeenth week). If the training is started at the right time, the movements of the muscles can attain a certain stage of perfection which is not possible if begun at a later period in life. For among grown people the paths of execution are already carved out to such an extent in definite directions, and the cells of ganglion are so far developed, that a perfection of the motor paths is scarcely possible any longer.

The practical conclusion resulting from these statements of psychological research must be that instruction in handwork should not begin too late. As experience has long taught, it is best joined with the play of the children before the school period and in the first school years; and in general it ought to be pursued as the chief thing in the

period from the eighth to the sixteenth year. By postponing systematic school exercises for the development of the motor perceptions, the best time is lost and the result becomes thereby questionable.

To be sure we must not fall into the opposite mistake and have the finer exercises, especially those of the fingers, commence too soon. Even here a carefully graded arrangement is indispensable; the universal, methodical maxim, "From the easy to the difficult," when applied particularly to the motor exercises, would be stated: "From the larger to the finer."

It is very plain that in this we are only following the law of development, which the course of human history also recognizes, and which we may therefore apply without hesitancy in this case.

In closing this line of thought, if we look over the entire cultural-technical development from the first crude tools to the system of the most highly developed technique of the present, two principal points of view are clearly to be seen: first, the tool is the only, and therefore, an indispensable means of raising the activity of our minds to refinement and strength. Therefore the tool alone affords us the means of gaining the first knowledge of our surroundings, especially of the products of nature; and upon it depends all further development in turning the products of nature to account in advancing human civilization. Moreover the tool stands as a result of the activity of the brain and hand in such vital relationship to the man himself that he sees in the creation of his hand a part of his own being—his world of perception embodied in material revealed before his eyes. Also in the animal world we find valuable technical means for furthering the

purposes of existence; it may be observed even in the nests, webs, and buildings of many animals. As is well known division of labor is also practiced among many animals in a tolerably perfect manner. "But only among men does Nature use the tool as the most important contrivance for the preservation and perfection of organisms. The tool is a higher development, which is mechanically free from organism, but biologically belongs to organism, as the shell to the mollusk and the house to the snail. The sociologist lays stress upon the fact that man creates the tool according to his plans for his own purposes; the biologist sees in this planning and creating an action of the brain, and at the same time a function of the body. That the material of the tool is matter supplied from outside, is secondary."

This thought has already been uttered by Herbert Spencer in a clear manner. Spencer says that every instrument of observation (for example the telescope, microscope, thermometer, scales) is only an artificial expansion of our senses, while the tools and machines, if it is desirable to distinguish these from apparatus and instruments, constitute an artificial development of our limbs. Otto Wiener developed further this thought in his academic inaugural address, *Die Erweiterung unserer Sinne* (The Expansion of our Senses, Leipsic, 1900), and has shown especially that even the most perfect tools never have a significance for themselves alone, therefore are never entirely independent of the organism of man. The most powerful telescope has no value unless it is united with an optical nerve into a unified apparatus for photographing the picture. In this, the optical nerve may, as far as it is concerned, stand still, or even retrograde, without harm to

the individual, if the function arising out of the coöperation of the nerve and the telescope, only continues in a constant development. He continues, "It is therefore a wholly unbiological thought to regard human culture as if it were a departure from the natural ways of development, and as if we therefore obeyed the dictates of biology better by destroying human culture with its customary division of labor and its development of tools."

And so this line of thought also leads to the statement given above, which might be the central idea of all such discussions, "that the entire history of civilization finally reveals itself in the history of the invention of better tools."

The extraordinary significance of the activity of the tool-perfected hand, in intellectual development is shown clearly in another direction, namely in the development of the language. According to the modern view, language has risen in and through work, and its development depends most intimately upon the unequal development of both hands of the person. In ninety-eight per cent of people the right hand has to perform the greater part of all work and must always especially protect the left hand when greater demands are made upon the strength and skill. Only in the decreasing minority of people, scarcely two in every hundred, does the left hand assume the functions of the right, and it is noticeable that in these cases all attempts at training to bring the right hand to its favored place are in vain; the individual concerned is and remains left-handed.

Even the pedagogical attempts, which are thoroughly justifiable, up to a certain extent, to develop the left hand through careful training (Liberty Tadd) will not change

the natural preference for the right hand. The inequality in the hands of people has deep-rooted reasons which may be considered as historical in development. According to the more recent psychology, the right-handedness of people, as well as everything which has to do with the spoken language, has its will center in the left half of the brain. This circumstance causes the supposition that a close relation exists between right-handedness and the development of the spoken language, a supposition which is thoroughly confirmed by the practical observations of the connection between speech and movements of the hand, and for which certain cases of diseases of the organs of speech also give further proof. In such cases, medical therapeutics makes use of certain exercises of the right arm in order to heal diseases of speech; and systematic instruction to develop the dexterity of the hand both in schools for the feeble minded and in institutions for idiots is offered with the same purpose. (This is excellently organized in the institutions at Potsdam, directed by Dr. Kluge; cf. Dr. K. Hopf: *Der systematische Handfertigungsunterricht, ein Glied ärztlicher Therapie in Idiotenanstalten* (Systematic Instruction in Handwork, One Phase of Medical Therapeutics in Institutions for the Feeble Minded), in the *Psychiatrisch-Neurologischen Wochenschrift* (Weekly Magazine for Psychiatric Neurology), and published in the *Blätter für Knabenhandarbeit* (Magazine of Boys' Handwork, November 8, 1904.) Exercises in movements of the right arm are well known as one of the remedies in the treatment of stuttering and other defects in speech, while corresponding exercises of the left arm can sometimes be used successfully with children, who, through the destruction of the center of

speech in the left half of the brain have lost the power of speech. By this means the establishment of a center of speech in the right half of the brain is brought about.

It is not possible here to go into detail in these difficult questions, which are not even wholly cleared up by research; but this much is in any case certain, that systematic training and education in dexterity of the hand must be demanded even in the interest of the development of speech. Each individual movement of the hand has its effect on the brain; indeed it must be said plainly that dexterity of the hand does not have its seat in the hand at all but in the head and brain. Consequently, handwork is without doubt a kind of intellectual training, and the hand is a sixth sense, a way which leads directly to the brain. The customary distinction between "head work" and "handwork" rests upon a fundamental error! There is no kind of handwork which does not require at the same time more or less brain work, and "the man who works energetically and artistically with his hands, as well as the philosopher, must possess a good head." Firmly rooted laziness is inseparably connected with stupidity and dullness.

These suggestions, however imperfect they may be in themselves, must here suffice to establish the assertion that the effects of a good course in handwork, even from a psychological point of view, are entirely unmistakable. Therefore we can, without further ceremony, apply the words of Demoor concerning the significance of handwork in the education of abnormal children to education in general: "*Handwork arouses the initiative, sets in motion the essential activities of the mind, attention and will, and requires a correct expression of the will. Thus it is an im-*

portant tool for the development of the intelligence and the permanent retention of knowledge in the brain."

But the fact should not be overlooked that instruction in handwork can contribute very essentially to the formation of character in a moral sense. The idea corresponding to the Bible utterance that work is a necessary evil for mankind, "In the sweat of thy face shalt thou eat thy bread," must, as a matter of course, be given up at the outset. It certainly does not apply to our children, for work, especially physical labor, is for them a benefit and a relief from sitting still; it is the most urgent need of nature for the purpose of physical and intellectual development and at the same time an activity giving positive pleasure. And that is true not only of children, but of grown people since primitive times, and it is also voiced in a passage from the Bible which we might place over against the one previously quoted, namely, that our life becomes rich through trouble and work. Goethe says, "*Tages Arbeit, Abends Gäste, saure Wochen, frohe Feste.*" (Guests by night and toil by day; weeks laborious, feast days gay!—*Translated by E. A. Bowring.*)

First of all, the play of children is for them serious work. The child is never more industrious than when he plays, and since something definite must be accomplished in the play, he learns through play how to work. But an essential difference still remains: play is voluntary, work is required, and "so through work we learn obedience, the most sterling virtue of children, better than in any other way." (Ziegler, *Allgemeine Pädagogik*, General Pedagogy, page 26.)

But it is false from a pedagogical point of view to demand of the child only so-called head work, the regular

learning of the school. This is, for the first school years especially, a truly bitter food which the child would not take of his own accord. On the other hand with well-directed and selected activities for the hand, he immediately becomes unwearying in his zeal; it is a well-known experience which can be encountered daily in carefully directed courses in handwork, that one finds there scarcely any children who are not industrious, attentive, and willing.

Instruction in handwork shows its significance for education in still another respect. From the false distinction between head work and handwork, the dangerous contrast has arisen between head workers and handworkers, and along with that, the lack of respect with which almost every representative of either of these callings regards the other. This disrespect with which handwork has been regarded since classic antiquity, has resulted in a similar one-sidedness within itself; and from this the mutually false estimate of the different callings and the social gulf which separates them have, for the most part, arisen. "On this account it is a welcome thought that the idea is of late constantly gaining new ground, that even our young people who pursue Latin courses are to learn and carry on handwork." (Ziegler, *Allgemeine Pädagogik*, page 27.) When the youth understands that it is just as difficult to acquire skill in an artistic piece of handwork as to gain knowledge in mathematics or in a language, then respect for the work of the hand, and, moreover, for work itself, will grow up as a matter of course. It is by no means accidental that instruction in handwork enjoys an especially high esteem in America; indeed this fact stands in closest connection with the characteristic feature of Ameri-

can popular opinion, which values in a person strength of will and cheerfulness in work above everything else. Scorn for physical labor is the surest and most unmistakable sign of lack of cultivation of every kind." (C. Götze, *Die Pädagogik der Tat.*" Pedagogy of Action.)

The high social significance of instruction in handwork, which Rousseau and Pestalozzi clearly recognized and emphatically expressed, is constantly receiving more stress of late, and rightly so. Especially worthy of attention are the words of Jules Ferry, former Minister of Public Instruction, who brought about the passage of the French school law of 1883, and at that time expressed himself concerning instruction in handwork.

Among other things he said: "In order that the nobility of handwork should be recognized not only by those who practice it, but also by society as a whole, the surest, the only practical method has been chosen: namely, the introduction of handwork into the school itself. When the plane and the file have received their place beside the circle, the geographical map, and the book of history; when they have received a place of honor; and when they shall be the subject of sensible and systematic instruction; then many prejudices will die out, much caste spirit will disappear, and on the benches of the elementary school the way to social peace will be prepared."

The most prominent men of different nations might be quoted, who have expressed themselves in a similar way, but it is sufficient to refer to the opinions of Tolstoi, who is convinced that "the social problem will not really be solved until handwork has again come into respect, and indeed not merely in theory, but also in practice; until it is considered just as respectable to plane wood and forge

iron as to count money, to fill out papers, to witness signatures, to teach in a technical college, in short, to pursue any one of those occupations which people proudly call head work." There is no doubt that instruction in handwork is adapted to arouse sympathy for the working man among those who do not earn their livelihood by the work of their hands. The employer, who has himself at one time taken a hand in a workshop, will have more respect for his workmen on that account and will more readily be inclined to favor reforms which serve the interests of the working classes and social peace. He will get a much deeper understanding not only of the economic situation, but also of the character and the general mode of thinking of the great majority of our people. Perhaps it is on account of this fact that in some of the ruling houses the tradition of having the growing princes learn a trade, still holds.

The social significance of instruction in handwork rests especially upon the fact that it gives opportunity for association in work, and for mutual helpfulness and advancement, such as is not permitted in any other branch of instruction. The external relationships themselves give rise to mutual consideration and helpfulness; and besides, it lies in the very nature of productive work that it leads to association and common interest in work. The social differences are forgotten in zeal for work, each is a friend and helper of his fellow workman; otherwise it would not be possible in the work of our school workshops when the attendance is voluntary, for us to unite boys of different ranks in society, who in life scarcely learn to know each other.

Moreover, the relationship of pupil and teacher becomes different and more favorable than that to which we have

been accustomed. The teacher approaches the boy as a friend and helper. The discipline can be managed in a new way, for the children are of themselves willing and zealous; every suggestion and act of assistance is received with thanks, and if the teacher understands how to direct his pupils in the right way, there is no need of scolding or of the customary school punishments. The entire system lies chiefly in developing independence in the pupils and in giving them practice in perceiving and reflecting. The more sparing of words the teacher of practical work is, the surer will he attain this end and the more perfectly he has the technique of his work at his command, the greater will be the confidence of his pupils in him. It is then taken as a matter of course that his friendly advice will be heeded, and he will gain an influence in the education of the boy which is far-reaching in the school and can directly and definitely affect his life. In this very respect instruction in handwork is one of the surest bridges for connecting school with life; it can exert a special influence in the difficult problem of the choice of a life work, such as no other course in school can easily do. In the first place, the practical instruction gives the school the opportunity of learning to know the "whole boy," and many a boy, who formerly has caused the teacher only trouble and vexation, becomes agreeable and valuable in the workshop. But his talents are also recognized better, and many parents are saved the disappointment which is inevitable, when the choice of a life work leads the growing boy upon the wrong road. Especially the tendency, so widespread to-day, of directing the rising young men to the learned professions or, at all events, to the middle and lower official classes, can by this means be controlled to some extent. But

let us finally give the youth a free path and teach him to know that other ways can also lead to fortune and contentment besides the way through books. Experience has long taught, as Herbart says, that "many a boy finds himself sooner at handwork than in school." While the model boy has very frequently failed in life, an efficient man has grown out of many a child, disappointing from a scholastic point of view. Many prominent men of practical life in industry and science have been thrust aside as useless in the school and dismissed as "deficient," a comment which they could later apply with justice to their former teachers; the famous Liebig, the historian Gervinus, Alexander von Humboldt, and many others are striking examples of this, for they were all regarded in school as people of limited capacity.

There is no doubt that an important means for developing the will can be seen in the education of the workshop. The practical Americans have long recognized this, and in their system of education, which is built up in such a striking way upon the development of the will, have brought this into application. The value of practical work in ethical education can be directly established by psychology. If psychology teaches that the will is a thought brought into execution, then the motor conceptions which excite the muscles to conscious movements, are also in a certain sense the raw material out of which the ethical will is formed. Flabby muscles and a weak will can be traced back to the same causes; namely, to a lack of motor activity of the brain. All kinds of physical exercises, gymnastics, and sport, naturally arranged, contribute not simply to develop the muscles, but also to make them subject to the purposes of the will. In this matter in-

struction in handwork is especially effective. As has already been shown, all finer work is controlled by groups of small muscles, and this limitation also demands accurate control over all the muscles which are not even used in the movement concerned. This power of mastery and the concentration of attention, which is connected with it, form an element which is of the highest significance in the development of the ethical will.

While instruction in handwork affects, moreover, the eye and hand, and by that prepares the way for a coöperation of the sensory and motor parts of the brain, it becomes in still another respect most important in the development of the brain and the will. It unites the different centers and establishes the connection between the sensory parts on the one hand and the motor on the other. This is of the greatest significance for the individual, whose whole value depends ultimately upon a sound and efficient brain. Clear reason, self-control, stability, equilibrium of character, strong will, and wise accommodation of the thing wished for to the conditions of life are the characteristics by which all human efficiency is attained. Psychology has recognized with perfect clearness the conditions under which these characteristics can develop; when this knowledge has once gained a victorious entrance even into pedagogy, then the old motto of the school workshop at Leipsic will become a motto for every school and educational institution:

Bilde das Auge, übe die Hand!

*Fest wird der Wille, scharf der Verstand!*¹

¹ Train the eye, exercise the hand,

Strong will be the will, clear the understanding.

CHAPTER II.

INSTRUCTION IN HANDWORK IN THE HISTORY OF PEDAGOGY AND IN THE LIGHT OF MODERN PEDAGOGICAL TENDENCIES.

Even with Comenius the thought is found that the training of the hand belongs to the problems of education, and he places it among the "fundamental studies," that is, among those "which comprehend the essence, the kernel and real content of culture." It is true, he includes among the exercises of the hand which he designates for the school, first of all writing and painting, but when he says further on that the person must be taught, "to use the hands for work," and that "children always like to do something," then it is to be assumed that he does not mean to limit the activity of the hand to writing and painting. In a chapter of the *Mutterschule* (*Informatorium matrum*) he also says: "The children like to build and put together houses of clay, shavings, wood, or stones, and this is the beginning of the study of architecture. The fourth, fifth, and sixth years will be full of problems in handwork, for it is not good for the child always to sit still. Therefore he should be encouraged and helped in everything which he attempts to do, so that whatever he does will have some meaning and will be useful in his later and greater work." (Cf. also *Didactica Magna*, Chapter 28, § 12, and Chapter 29, § 6.)

In a much clearer way Prof. Erhard Weigel of Jena, (died 1699), who may be regarded in a certain sense al-

most as a forerunner of Friedrich Fröbel, expresses himself concerning the necessity of exercises for the hand. The peculiar inventions which he introduced into his "School of Virtue" in Jena for the purpose of sweetening the learning, may be mentioned incidentally; it is very significant that he wished the children to be instructed to build with small boards or blocks, to make figures out of paper or pasteboard, to form models out of paper and wood, to construct sundials, to measure heights and distances, etc. In all these requirements there is plainly expressed a thorough understanding of the necessity of activity for the youth, as well as an appreciation of the kind of instruction which should be established to fulfill this need.

From another point of view John Locke demands the training of the hand. It belongs to the education of the "galanthomme," the perfect gentleman. Even the nobleman is to learn a trade and be instructed in some practical activity. Indeed, Locke proposes gardening and work in wood, since these activities divert the mind and exercise the body. Skill in working metals, glass, and stones (engraving, polishing, cutting, etc.) also seems to him especially adapted for this purpose, "since a young man cannot always be occupied with studying, reading and social intercourse." All these activities he regards chiefly as a means for meeting the dangers which idleness brings with it; he seems to fail to understand that they might also have an educative value in other respects.

Rousseau goes into the pedagogical side of the problem much more deeply. In his *Émile* he expresses himself as being opposed to all instruction which is given in the form of a lecture and to the imparting of any knowledge by

means of the word of the teacher. He insists that the pupil be required to make all the instruments necessary for his experiments, and that he acquire a knowledge of them himself. He writes: "If I keep a child busy in a workshop instead of chaining him to books, then his hands work for the good of his intellect. In order that the pupil may learn the dependence of people upon one another, let the teacher take him into the workshops and not allow him to see any work at all except what he himself makes. Let the teacher keep constantly in mind that an hour's work will teach the pupil more things than he can retain in his memory from a whole day's explaining."

These utterances show clearly Rousseau's conception of handwork as a means of education, from which it can be clearly seen that he emphasizes the significance of handwork in intellectual development, even though he later thinks more of its importance in another respect; namely, with reference to social development.

Rousseau's views have influenced the Philanthropists, who have striven toward a practical realization of his ideas in their institutions. In this respect Rousseau had a predecessor in August Hermann Francke, the founder of the *Pädagogium*¹ in Halle. Francke also occupied the children of his great Orphans' Home with handwork—spinning, sewing, knitting, etc., yet this was done especially for economic reasons. In the *Pädagogium* in which the sons of aristocratic families were educated, handwork was regarded as a means of education. The pupils were instructed by masters in turning, pasting, and glass-cutting, and were directed in making all kinds of useful things. Francke considered the chief value of these exercises to be

¹ An educational institution, especially for boys.—*Translator*.

in the fact that "they prevented idleness and childish amusements."

From the Francke Institutes, handwork passed over to the *Realschulen*, then newly organized. The founder of the first school of this kind, Semler in Halle, even insisted that a good, accurate eye and a ready hand could be acquired by practicing useful manual exercises. In the *Realschule* founded by Hecker at Berlin, turning, pasting, glass-cutting, finishing, and other activities were carried on and similar work is reported of other *Realschulen* of that time. So the inspiration went from Halle to South Germany and Austria and there caused the establishment of industrial schools and *Realschulen*. It also appears, that instruction in handwork in the orphan schools was there arranged as a preparation for the future industrial life work of the pupils. These ideas found further enlargement in the industrial schools (*Industrieschulen*) founded toward the end of the eighteenth century, which after several experiments in Braunschweig, were brought to life in Bohemia chiefly through the efforts of Kindermann, at first pastor, and after 1775 professor and inspector of the public school system in Prag. He had regard for economic considerations when he looked upon instruction in handwork as the chief means for improving the welfare of the people, but in doing so he did not lose sight of its educative and moral significance. Consequently the industrial school is a product of the popular pedagogical strivings of that time, which found their strongest champions in Maria Theresa and Joseph II of Austria and in Frederick II of Prussia. After the example set by them, all parts of Germany joined in emulating them by establishing industrial schools, mostly in connection with the

public *Volksschulen*. For the most part women teachers directed the instruction in the industrial classes. Spinning, knitting, and sewing were carried on in the girls' classes, while in the boys' classes woodworking and braiding were additional activities. In the country there were added instruction in the cultivation of gardens and fruit trees, and the culture of silkworms and bees. As a subordinate purpose, the effort was made to let the children earn something from their work; the industrial schools were often simply designated as "schools for making a living." Their connection with the schools for study was merely external; there was scarcely any thought of carrying out pedagogical ideas. Industrial schools were also established especially for children of the lower and poorer classes.

But even in the educational institutions for the youth of higher rank, handwork was not overlooked, especially in those of the Philanthropists, all of which were under the influence of Locke and Rousseau. Basedow demands in his *Methodenbuch* (Book of Methods) that children from the fourth year on be gradually accustomed to physical labor, but without any compulsion. Two hours of handwork a day along with six hours of instruction are necessary, and indeed, children should be occupied with garden work in summer and with the construction of playthings, etc., in winter. In accordance with this, lessons were arranged for the older pupils according to the curriculum of the Philanthropist of Dessau in turning and cabinet work, and later in pasteboard work and finishing. Handwork was extensively practiced in Schnepfenthal. Salzmann esteemed it most highly and considered it indispensable in an education which was to make the people

good and happy. "Are not the hands the finest tools of a man? Can one indeed believe that his mind is capable of expressing his manifold powers, when his best instruments are rusted, when his hands are useless?" he says in his book, *Noch etwas über die Erziehung* (Additional Facts Concerning Education.) In the *Ameisenbüchlein* (Little Book on Ants) he recommends the use of handwork for three reasons: satisfaction of the longing for activity, improvement in the health of the children, and exercise of the mind, eye, and hand. In Salzmann's opinion the objections raised against handwork come for the most part, from those educators who have not learned to know this work, and for that reason try to ridicule it. The instruction in handwork should be turned over to educators, not to handworkers.

In the institution at Schnepfenthal the following work was carried on: construction of playthings out of paper, wood-carving, net making, basketry, pasteboard work, finishing, cabinetwork, and turning. In every living room there was a workshop with the necessary tools. The instruction was directed by B. H. Blasche, active as a teacher from 1796 on, whose writings give an interesting insight into his efforts to develop instruction in handwork from the theoretical and practical points of view. These writings are still valuable to-day.

The remaining Philanthropists shared the views of Basedow and Salzmann concerning the educative value of handwork. Campe, especially, has expressed himself unequivocally concerning it. In one of his works he demands the transformation of the *Volksschulen*, which he calls schools of laziness and inefficiency for life, into industrial schools. In all the educational institutions which

were founded through the influence of the Philanthropists, the examples of Dessau and Schnepfenthal were followed and instruction in handwork was introduced. In many of these institutions (for example, in Keilhau, Weinheim, and others) it has been retained to the present time.

As time passed, the industrial schools could not be maintained, partly on account of lack of means, and partly because of the difficulty in securing good teachers. Most of them became disorganized during the war time at the beginning of the nineteenth century. Even the impulse which the educational system received under the influence of the teachings of Pestalozzi, did not favor them, since they were in some respects opposed to his ideas. Yet isolated industrial schools have existed until recently, for example, in Holstein and Oldenburg. In like manner the instruction in work, which is carried on for industrial purposes in many educational institutions, can be traced back to the impulse derived from the industrial schools. An instance of this is in those schools for children who are morally depraved or afflicted with physical deficiencies.

The conviction that work has value as a means of education has not been lost sight of in German pedagogy. It is presented in an especially clear and impressive manner in the writings of J. H. G. Heusinger (died 1837.) Heusinger tried to introduce the principle of activity into education, asserting that man was born for doing and not for speculating. Therefore the impulse for activity is to be used by means of education in every way, since it leads man to avenues of knowledge which would otherwise remain closed to him. Even in the development of the artistic sense, it is of significance, since modeling, for example, is more important in the development of taste than drawing.

Similar views to those of Heusinger were developed by B. H. Blasche (died 1832), who has already been mentioned, but preëminent in the development of them was Pestalozzi.

Pestalozzi's attempt to maintain an educational institution for poor children at Neuhof was a well-known failure. His ideas of how the youth of the poorer classes were to be educated by means of work and their social condition improved have been developed in *Lienhard und Gertrud* (Leonard and Gertrude). In this book he shows that children were to sew, spin cotton, perform tasks in garden and field, and, along with these activities, learn to read, sing, and study arithmetic. In this way he wished to unite the training for a life work with the *Volkschule*, and in different addresses before ministries and other authorities he expressed this thought. The idea of such education for the poor occupied him until his last years, and even at the age of eighty he considered anew the plan of organizing an industrial school at Neuhof. The fact that he comprehended the nature of such a school much more thoroughly than the other representatives of industrial education, is shown by the utterances in *Lienhard and Gertrud* and in other writings. He had a clear conception of the educational significance of work and of its influence upon the intellectual and moral development of man, as is shown, for example, in the following utterances: "It has become indisputably clear to me how much more truly a person is moulded through that which he does than through that which he hears;" "in the education of people, serious and severe training for a life work must necessarily precede all word instruction." He makes his schoolmaster, Glülphi, in *Lienhard and Gertrud* the ve-

hicle of his ideas, and causes him to say: "Every day he saw more clearly how industry trains the understanding and gives strength to the feelings, as it prevents the deadly warping of the senses and saves them for the forces of life, drawing them back from the weakness of listening to our nonsense about activity for activity's sake. These higher views concerning human development caused him to bring the lathe for turning, the planing bench, the sewing cushion, etc., into his school."

Pestalozzi regrets very much that the children of the higher classes so generally lack a simple preparation in mechanical ability. He points out this lack as a "wrong path upon which the course of nature, in the unfolding and development of its powers, has been forcibly thrust aside." Therefore he considers it necessary that these children should be led by means of the activity of the hand to the activity of the mind; and, with this end in view, he has the pupils in the institution at Ifferten, in their geography lesson, imitate in clay the physical features of the surrounding country. Cabinetwork, turning, and paste-board work were also carried on at Ifferten.

Even in the period of the greatest effectiveness of his system, when he was occupied in writing his *Elementar-methode*, Pestalozzi did not lose sight of the significance of handwork. He places it in the field of artistic training; that is, the training for technical ability upon which depend all accomplishments which are needed in domestic and civil life. Ability (*können*) is regarded as the outward expression of the inner, the intellectual. The essence of the development of artistic ability consists in the development of thought and reason. The use of objects (the A B C of object teaching) offers an opportunity to

utilize the means at hand, through the use of which, the foundation is laid and the intellectual foundation for art is established. The development of mechanical ability, which is still necessary—in other words, the development of the physical side of artistic training—includes the training of the human senses and the limbs. Their goal is “the highest possible control of the nerves, which gives assurance and perfect control of hand and foot.”¹ Both phases of artistic training, the intellectual and the physical, must be carried on together from the cradle up, and in close relation to each other. Education cannot have as its goal simply to develop mechanical skill. Neither is the artistic training of the pupil in itself sufficient. He says “The careful and wise use of the means of training offered in domestic life is just as important from the physical as from the moral and intellectual point of view.” Yet it would be wrong to use the ability which domestic life furnishes merely as a means of education. But the instruction for acquiring skill in the vocation must be preceded by a general education in art, which is in reality the A B C of art. This A B C of art is a series of exercises which proceed from the simplest (striking, carrying, hitting, pulling, turning, etc.), to the most complicated, and have as their purpose to give the pupil accuracy in whatever he does.

“These elementary gymnastics in art” are also to furnish the natural foundation for the training for industry, so that special training for a trade would arise from the elementary exercises which the system teaches. From it

¹ It might be said that Pestalozzi in this statement shows that he ingeniously foresaw what modern psychology, with its scientific reasons, expresses in the phrase: “Transforming the conscious into the unconscious,” and “carving out nerve paths.”

Pestalozzi believes the most varied and difficult movements of industry will become mere play, and in his letters to influential people he refers repeatedly to the remarkable results for industry which he expects from the influence of his method. Yet the attempts to devise special exercises as a pedagogical foundation for industry have never been completed.

The association of study and work is also demanded by Fichte. His *Nationalerziehung* (National Education) ought to induce anyone to believe that he can help himself on in the world through his own strength. If the pupil is accustomed to work, he escapes temptation caused by anxiety about nourishment, and it will be a matter of honor with him to depend upon no one else for his livelihood. The most fundamental kinds of work are the cultivation of the field and the garden and the industries connected with them. This work is not to sink to mere mechanical activity, but is to be animated by the thought that it is preparing for the future life work of the pupil. In the educational state which Fichte constructs for the execution of his ideas, all the needs of the members of the state must, as far as possible, be satisfied by themselves. Each one works for the whole and participates in the blessings of the whole. (*Fichtes Ideen über die wirtschaftliche Erziehung* (Fichte's Ideas concerning Economic Education, von E. Zeissig. *Blätter für Knabenhandarbeit*, 1897.)

Even the great theorist, Herbart, has clearly recognized the pedagogic significance of handwork. This is shown especially by his well-known utterance: "The hand has its place of honor along with speech, in lifting man above the condition of the animal." In like manner Her-

bart expresses himself in other places concerning the importance of training the hand, and demands, for example, that every boy and young man learn to handle the well-known tools of the cabinetmaker. He says: "Mechanical skill would often be more useful than gymnastics. To the *Bürgerschulen* belong work schools, which need not be exactly trade schools."

Other places in Herbart's works show that he recognizes in physical labor an excellent preparation for systematic activity and at the same time an important means for forming character. He says, "Many a growing boy finds himself sooner at handwork or in business or in agriculture than in school."

Among the representatives of the Herbartian school Ziller and Ernst Barth in Leipsic have especially valued instruction in handwork. Ziller sees in it an essential broadening of the general instruction in the preparatory school, and a foundation for the later technical instruction in the trade school or workshop. Consequently instruction in handwork necessarily belongs to the training of pupils who wish to devote themselves later to a practical calling. Since 1865 Ernst Barth has carried on in a practical way instruction in work in his preparatory school, where he has found in W. Niederley an expert assistant. In his appreciation of instruction in work, Barth goes farther than Ziller, since he regards it not simply as a preparation for the training for a life work, but as the best form of object teaching as well. In accordance with this idea, it is to begin with the first school year, and in all the grades of the preparatory school it is to be carried on in connection with the other branches of instruction. In his book which was written in conjunction with Niederley, *Die*

Schulwerkstatt (the School Workshop), 1882, Barth shows how instruction in work is to be carried on in the different grades. It is united to history of civilization and natural philosophy, to geography, geometry, and drawing. From the twelfth year on, but not until then, preparatory instruction for the training for a life work is to be offered in special classes, which is to be adapted to the local conditions and branches of industry.

As representatives of the Herbartian school, who accept instruction in handwork in their pedagogical theories, and who also try to some extent to develop it practically, may be mentioned: Willmann, O. W. Beyer, and W. Rein. Willmann has expressed himself concerning instruction in handwork in different places, especially in his *Didaktik*, (Didactics.) O. W. Beyer in his book, *Die Naturwissenschaften in der Erziehungsschule* (Natural Sciences in the Boarding School), developed a system of instruction in work, the problems of which he derived from the history of human industry; moreover, special stress is placed upon his article in Rein's Encyclopedia. Professor Rein's reputation for theory and his practical experiments in the Pedagogical Seminar in Jena in the way of systematic development of instruction in work are considered of great importance.

While the representatives of the Herbartian pedagogy agree in disapproving of a mere external connection of instruction in handwork with the school, but make it dependent upon the other branches of instruction, in that it is to take its problems from them, yet we find an essentially different position of the instruction in work in the educational system of Friedrich Fröbel. Fröbel agrees with Heusinger in his views since, like him, he emphasizes the

fact that man is born for action. Acting, producing, doing, precedes thinking, in the development of the single thing as well as in the development of humanity. Activity and doing are the first manifestations in the child's life; in the impulse for activity the very existence of the human being expresses itself. Therefore education must begin with doing; everything must be connected with the training of the impulse for activity and from this everything must be evolved. In this is clearly expressed the contrast between Fröbel and Herbart. While the latter wishes to make handwork dependent upon instruction in other subjects, according to Fröbel, instruction in all other subjects proceeds from handwork and is founded upon it. A further development of these ideas of Fröbel is found in Pösche, Georgens, and Deinhardt and, in most recent times, in the American, Dewey. The latter bases his opinions upon the teachings of modern psychology and sociology and, consequently, must be considered more fully in a later place. Concerning those first mentioned, on the other hand, it can be said in general that their theory carries out further the thoughts of Fröbel and attempts to make them especially useful with reference to political economy. Pösche, who was inspector of education in Berlin, states that it is his purpose "to make an effort to organize the practical activities of the society into an educational institution for the youth, to found learning and knowledge upon activity and exercise in work, and to add the artistic-industrial element in the life of our people to the theoretical one-sidedness of our present *Volksschule*." Georgens and Deinhardt, who wrote their works in collaboration, presented at the Ninth General Assembly of German Teachers theses in which they say: "Creative

work must be represented within the *Volksschule* if an all-round development is to be the aim of pedagogy. . . . Exercises in work must be joined in organic unity with instruction as a whole, and must contain an artistic as well as a gymnastic element."

Though Diesterweg gave his approval to the method of Georgens and characterized it as the "way of Nature," as "pure instruction of Pestalozzi and Fröbel," there arose between several of the followers of Diesterweg on the one hand and Georgens and Deinhardt on the other, a severe conflict, which was not without influence upon the General Assembly of German Teachers soon afterward held in Frankfurt (1857.) After a speech of Dishart, this organization declared itself opposed to the principle advocated by him and his friend Georgens, viz.: "Education for work by means of work," and with that the problem of instruction in work for the school seemed to be settled—a precedent which was observed again in a very similar way forty-three years later in the General Assembly of German Teachers at Cologne.

Isolated efforts were made to disseminate the ideas of Pestalozzi and to turn them to account in the school, but like those of Beust in Zürich, Stoy in Bielitz, Willmann in Vienna, and others, they could gain but little influence and were lost in the mass of proposals for pedagogical reform. On the other hand, the attempts were more effective which started from an economic point of view and which were undertaken in rescue homes, boarding schools, orphans' homes, and similar institutions. Especially worthy of mention in this connection is J. H. Wichern, the founder of the *Rauhes Haus* in Hamburg, who, in his contribution *Über Erziehung zur Arbeit, insbesondere in*

Anstalten (Concerning Education for work, especially in Institutions), Hamburg, 1867, showed that the idea of education in work was not lost.

In a still greater measure assistance was given for its advancement by the problem announced by Magistrate Schindler in Zürich: "How can the instruction of the *Volksschule* be freed from the abstract method and be made more effective in the development of the powers of the mind?"

For the solution of this problem Dr. K. Michelson (died in Hildesheim in 1862) and Prof. K. Biedermann, (died in Leipsic, 1901), proposed the union of the *Volksschule* with a work school. The significance of the book written by Beidermann (Karl Friedrich), *Die Erziehung zur Arbeit, eine Forderung des Lebens an die Schule* (Education for Work, a Demand of Life upon the School, Leipsic, 1852), justifies us in looking upon this even today as one of the most important writings on the establishment of instruction in work, and in looking into its contents somewhat more closely. Professor Biedermann, who through his inquiries into the political life of the middle of the last century, and through his comprehensive studies in the history of civilization, became convinced that there was need of a thorough reform in the German system of education, justified his demand for "education through work" by pointing out, first of all, the drawbacks and disadvantages of purely theoretical instruction. In connection with it he calls attention to the overburdening of the pupils, and especially to the injuries to the health which exist in all kinds of schools as a result of the overloading. In a later chapter, *Schule und Leben*, (School and Life), he correctly emphasizes the fact that

the theoretical knowledge and acquirements gained in the school have in some respects little significance for life, moreover that the school not infrequently weakens in the pupils the taste for domestic and practical pursuits, and accustoms them to look down with scorn from the height of their imagined wisdom upon the activities of their parents and companions. In order that the school may really be a preparatory school for life, he demands of it the following: along with knowledge and understanding, along with memory and the other powers of receptivity, it must also develop important means of independence, viz.: practical ability, the inclination for construction, keenness of eye, skill of hand; and, above all, will power; in a word, it must be not only a school for teaching and learning in the usual sense of the term, but at the same time a school for work, and must assume its task of educating the pupils for work.

The claim that the youth is in need of training for creative activity is based by Biedermann upon the needs of human nature, especially those of the child and upon those of the German people as a nation. He goes on to discuss the pedagogical advantages of the practical method, and refutes the objections which have been raised against instruction in work. The question whether it is possible to make room in the curriculum for courses in handwork in the schools, especially in the *Volksschule*, forms the contents of a further chapter, which is enlarged by proposals concerning the organization of instruction in work according to pedagogical principles.

In the second edition of the work which appeared in 1883 in an essentially re-written form, Biedermann has presented the movement for the introduction of instruc-

tion in work in its further development up to that year.

The animated discussions which were caused by the writings of Michelsen and Biedermann, and which were carried on by prominent school men such as Curtmann, Eisenlohr and Diesterweg, led to no settlement of the question. Eisenlohr declared himself opposed to the proposals of Michelsen and Biedermann, Curtmann wished to secure education for work without actual instruction in handwork, and Diesterweg considered the training for practical work necessary, but wished to assign it to the oversight of the family, not the school. "The equipment of schools for work is an encroachment upon the rights of parents and would certainly call forth a protest from all the country people" is the decision of Diesterweg. This he later modified considerably.

The pietistic-reactionary tendency of the school world at that time was not favorable to the further development of the idea of instruction in work, since it saw in the school for work an expression of the materialism then penetrating all circles of life, which would necessarily injure the education of the youth for ecclesiastical service.

In the meantime, however, the ideas of Fröbel and other champions of instruction in work had exerted a further influence, especially in foreign countries. In Austria in the year 1872 a decree of the Minister of Education had permitted the introduction of modeling into the curriculum of the *Realschule*, and in 1873 appeared a work by Erasmus Schwab, Director of the *Gymnasium* in Vienna, *Die Arbeitsschule als organischer Bestandteil der Volksschule* (The School for Work as an Organized Element of the *Volksschule*), which had the same effect as the writings of Michelsen and Biedermann in Germany.

As Schwab expressed himself, "The most important pedagogical problem of our time is the introduction of work as an educative element in the organization of the *Volksschule*. It cannot otherwise fulfill its duty of educating the people, a task which becomes every day more difficult. After the actual instruction in handwork has been generally established, an effort should be made to unite a school workshop with the boys' schools." At the World's Exposition in Vienna in 1873, Schwab exhibited a model of his own school, which included a school workshop and a school garden for boys and girls. (*Die österreichische Musterschule in der Wiener Weltausstellung, 1873, von Dr. E. Schwab, mit 2 Plänen von Krumholz, Wien, 1873.* The Austrian Model School at the World's Exposition in Vienna, 1873, by Dr. E. Schwab, with two plans by Krumholz, Vienna, 1873.) These suggestions were received by the Austrian *Bürgerschulen*, as well as in the *Seminar* at Troppau, and led to the organization of a Society, the purpose of which was the advancement of instruction in handwork in Austria. In the direction of this society Anton Kreuzig (died 1905) performed valuable service.

The unsettled internal political conditions in Austria explain why the further development of instruction in work could secure an interest only in limited circles. The service of men like J. Urban, A. Bruhns, R. Petzel, and G. Herbe in Vienna, A. Naske in Brünn and others, who exerted themselves to develop instruction in work from a pedagogical point of view, is the greater because of the difficulties under which they worked.

It is an often repeated occurrence that ideas, the dissemination of which makes for the development of cul-

ture, get a foothold more easily in smaller districts than in large states in which differences of race and nationality offer great resistance to the spread of a new idea. This is, in general, also true of the idea of instruction in work (its spread in the United States of America being an exception) which has completely made its way into the small countries of the North, especially in Finland, Sweden, Norway, and Denmark. The course which the movement has taken is as follows:

In the year 1857 a schoolman, Uno Cygnaeus, was commissioned by the Senate of Finland to make a study of the systems of instruction of the people in the different European countries. He traveled in France, Germany, and Switzerland, and upon his return the commission was given him of working out a plan for the reorganization of the system of *Volksschulen* of Finland. This plan, which went into force in the year 1866, contained the stipulation that technical work should be regarded as a required course in the curriculum of the *Seminar*, and the city and country schools. It was clearly the ideas of Pestalozzi and Fröbel which inspired the Northern schoolman; but at any rate, Finland was the first country to introduce into the school instruction in handwork for boys as a regular course. From Finland it made its way to Sweden and Denmark, and has been carried to a high stage of development there under the name of *sloyd*. It cannot be said that the idea was developed independently in either one of these countries, since in Denmark, for example, the opposite is true, where the Retired Captain of Horse Clauson-Kaas (died 1906), as early as the sixties, became interested in instruction in handwork thru the education of his own children. He established in Copenhagen a

kind of wandering school workshop, in which he gave instruction of all kinds of useful occupations, and in 1873 founded the General Danish Society for Domestic Industry, which created a stir by its exhibits at the World's Exposition at Vienna. Through this, Clauson-Kaas became known in Germany, and after he began to defend his ideas publicly in lectures, they found many followers. To be sure his followers at first were mostly people who were not pedagogues, as the name of the organization which he founded at Berlin in 1876, the Society for Domestic Industrial Activity, goes to show. A course for the training of teachers contributed most toward the further development of the idea. This course was offered by Clauson-Kaas in Emden in 1880 and was attended by sixty-three people from different parts of Germany. Thru these people,—most of whom were teachers, whom Clauson-Kaas succeeded in inspiring,—his teachings were carried to different parts of Germany and led to practical results in Dresden, Görlitz, Berlin, and other places.

Clauson-Kaas had not overlooked the educational significance of instruction in handwork. Rather it had been the starting point of his activity; but in the further course of development this idea of domestic industry came into the foreground. At least his efforts in Germany were at first regarded only from this point of view, as is evident from the statutes of the Berlin Society, mentioned above, which had in mind the construction of objects which were easily made, as far as technique is concerned. A. Lammers in Bremen, who took up the idea of domestic industry and caused it to spread widely by means of his efforts thru his magazine *Nordwest* (Northwest), as well as by his lectures in different places, took hold of the matter first

only from this side. A lecture which Lammers delivered in 1880 in Leipsic before the Society for the Promotion of the Public Good gave the impetus for founding a pupils' workshop in that place, where the ground was already prepared for a new movement by the previous activity of Ziller and his pupil Barth. This movement, with a purely pedagogical tendency, soon found here a further development, which was ushered in by the writings of Barth-Niederley, which have already been mentioned, and by a work of Oberlehrer Dr. W. Götze, *Die Ergänzung des Schulunterrichts durch praktische Beschäftigung* (The Completion of the Instruction of the School by Means of Practical Activity), which appeared in the year 1880.

In the school workshop of Leipsic, which was founded in that year, the educational side of instruction in handwork was kept in mind from the very beginning, and since courses for teachers were arranged along with those for pupils, which were very soon attended even by foreign teachers, the Leipsic movement found followers in other places and was rapidly advanced.

E. von Schenckendorff, at that time town-counsellor and later deputy in Görlitz, proved himself the most active and most cautious champion of instruction in handwork. Even in the year 1880 he expressed in a memorial address to the government the advantages of domestic industry for the people of Upper Schleswig, and he further emphasized most forcibly the social-pedagogical significance of instruction in handwork. He stated that it was one of the means of building up an efficient class of handworkers and of creating in the upper classes of society respect for handwork and an understanding of its

products; in this way he held, it would be able to contribute essentially to the improvement of industry. These statements received a hearing from the public and from the authorities the more easily, because the eyes of all intelligent people had been opened at the World's Expositions of 1873 and 1876, by the previous failures of German industry, which was branded for a long time by Reuleaux' severe judgment, cheap and poor. They succeeded, therefore, in inducing the ministry of public instruction to appoint a committee which was commissioned to make a study of the schools for work in Denmark and Sweden. The commission found, especially in Sweden, much that was deserving of attention; for example, in Gothenburg handwork was carried on in the *Volksschule* as a regular subject of instruction, and in the *Seminar* for Teachers of sloyd at Nääs where Director Salamon, in an institution founded by his uncle Abrahamson, directed in a pedagogical manner the training of teachers for instruction in handwork. The method of Swedish sloyd which was perfected in Nääs has since then exerted a great influence upon the development of instruction in handwork, not only in Germany but also in other countries, and even if we do not allow ourselves to be influenced in many respects by the principles of the Swedish system (for example, in that we carry on, not only woodwork, but also other courses of instruction in work), yet its essential main features are to be recognized in the German instruction in work.

The external development in Germany was furthered by the formation of a central committee for Instruction in Hand Skill and Home Industry in Berlin in 1881 at the instigation of E. von Schenckendorff. This committee was changed in 1886 into the "German Society for Boys'

Handwork," from which arose an organized movement and a systematic effort to develop handwork in accord with pedagogy. The society was directed first by A. Lammers, and since 1892 by E. von Schenckendorff. In the twenty years of its existence the Society has in an effective way been active in the spread and development of the idea of instruction in handwork. The propaganda was accomplished on the outside by means of meetings and the spread of printed matter, and within the society a number of enthusiastic men occupied themselves with the pedagogical development of instruction in handwork. Among these, along with Grunow, Noeggerath, Groppler, Kunath, and others, Götze should be specially mentioned, who by founding a normal institution in Leipsic in 1887, of which he was the head until his death in 1898, as well as by his numerous writings on the further development of instruction in handwork, has exerted the greatest influence. Thru the teachers trained in Leipsic, the number of whom will soon have exceeded two thousand, the "Leipsic Method" has become known all over Germany, and even beyond. The great respect in which the institution at Leipsic is held in foreign countries is shown by the great number of foreign members in its classes. Since 1897 this institution has had its own building and on that account has possessed a greater capacity for development. (See article by R. Rissmann, *Geschichte des Handarbeitsunterrichts* (History of Instruction in Handwork), in Rein's *Encyklopädisches Handbuch der Pädagogik* (Encyclopedic Handbook of Pedagogy.)

Only a few of the men who in the last decades, especially in the German Society for Boys' Handwork, have been active in the spread of instruction in work, were con-

nected with school work; indeed it is very significant that the new movement found its strongest opponents in the circles of schoolmen. Even in 1882 the German *Lehrertag* (Teachers' Association) in Cassel expressed itself as decidedly opposed to instruction in work, and since then similar statements have been made not only in a number of provincial assemblies but they have in fact determined the key-note of all the articles which have been published on instruction in handwork in the pedagogical press. Especially violent attacks were published during the nineties against instruction in handwork and its defenders by the Frankfurt *Schulzeitung* (School Journal), and the tone which the editor of this magazine and other pedagogical writers assumed made it difficult for the advocates of instruction in handwork to maintain their position in an effective way. The rude rebuff which instruction in handwork received at the teachers' conference at Cologne in 1900 seemed to decide the battle which had raged violently for several years against the new movement. But as often happens in such intellectual battles, the new ideas founded upon the convictions of the majority were not to be thrust aside; on the other hand the saying of Goethe was verified that the opponents of such ideas are only like one who strikes into glowing coals: the sparks fly about and kindle a fire even in places where they would not otherwise have reached. The development of things in the last few years has shown this to be true with reference to instruction in work. The opposition caused large groups of people to prove that the new idea had pedagogical value, and the friends of the movement were spurred to stand together the more firmly for its defense and to secure the means of defending their cause. This opposition has prevented the attempt to in-

troduce handwork into the public schools too early and too hurriedly; on the other hand, it has not been able to shake the foundation principles of the movement, and so there is definite hope that in the future instruction in handwork will gradually attain the place which belongs to it in German schools.

It still remains to give a brief survey of the development of instruction in work in the countries outside of Germany. With reference to the northern countries, especially Finland, Sweden, and Denmark, the principal facts concerning its historical development have already been recorded. It should be added that sloyd in the Swedish schools is generally not obligatory, but on account of the abundant means which is granted by the state and other authorities it is quite generally accepted and is introduced into the majority of schools. The conditions are similar in Denmark, where, especially in the towns, instruction in sloyd is carried on according to a system worked out by A. Mikkelsen, while Norway, by the school law of 1896, has made it obligatory for all elementary and secondary schools.

The development of instruction in handwork has become of special importance in France, where it was made an obligatory course in all elementary schools by the educational law of 1882. This result was secured after attempts to introduce it had been made in several of the schools of Paris ever since 1873. These attempts, dating back to the personal initiative of Salicis, formerly a naval officer, were a preparation for the further activity, culminating in the unique combination of theory and practice which is shown in the instruction in handwork in France. At any rate it has developed quite independently, even

though the inspiration for it came to France from other countries.

The same can be said of England, which entered comparatively late the ranks of those countries which have accepted instruction in handwork. The inspiration for it came chiefly from Sweden and Germany, but England thru its independent development and energetic and self-sacrificing help in the advancement of the idea, has already reached a stage in its development which we are at present far from attaining in Germany. The great influence which the lay element exerts upon the English schools in general has been very favorable toward the development of instruction in handwork, since the layman as a rule has met it in a more unprejudiced way than the professional pedagogue.

The first impulse for reform in the public school system of England with regard to practical courses of instruction was started by the distinguished physiologist Huxley, who as early as 1887 demanded a careful investigation of the system of industrial education. He points out the chief weaknesses of the present school instruction to be the custom of learning merely from the book and the lack of regard for practical needs and conditions. And furthermore the child is brought too little in touch with real things and facts. As a wholesome remedy for these weaknesses he recommended intensive object teaching, along with which the training of the eye and hand must be accomplished by means of drawing, modeling, and other kinds of handwork. It is characteristic of English conditions that even now the leadership in the province of instruction in handwork lies in the hands of prominent scientific men; especially has Sir Philip Magnus, for many

years President of the National Association of Manual Training Teachers in London, and an authority in the field of theoretic physics, performed great services in this respect.

The development in the other countries of Europe can be characterized in a few words. Switzerland, in harmony with the high degree of development of the system of its elementary schools in many of the cantons, has advanced comparatively far in systematically arranged instruction in work; this is especially true of the cities of Basel, Zürich, Bern, Lausanne, Geneva, Neuenburg, and others.

In Belgium instruction in handwork is carried on especially in *Seminare*, in Holland also in several elementary schools, of which that in Enschede has won distinction far beyond the boundaries of Holland, because of the activity of its former Rector, de Vries, (cf. Lehmensick: *Eine Studienreise nach einer Holländischen Volksschule* (A Journey for the Purpose of Studying an Elementary School of Holland.)) The development of instruction in work in Austria has already been touched upon, at least in so far as it offers general interest. In Hungary, Servia, Bulgaria, and especially in Roumania, its advancement has from time to time been undertaken very energetically, even though these efforts have not always been made with the same stress, on account of the frequently changing political conditions. In general this is also the case in Russia, where, especially in the provinces of the Baltic Sea, the ideas received from Germany and Finland early took root. On account of the economic conditions, the Russian people have not been able to develop their characteristic talent and inclination for the technical as

they might have done under more favorable circumstances. Meanwhile it is to be noted that there has come from Russia to the United States of America a very fruitful inspiration, which has essentially influenced the development of the instruction in work there. Since this development has proceeded in a very characteristic way, it requires a somewhat more thorough consideration. It actually began in the year 1876 when, at the World's Exposition in Philadelphia, the European exhibits of systems of industrial training attracted the attention of the Americans. It was especially the Russian department in which the models exhibited by the Technical College of Moscow gave the impetus for taking up the problem of industrial training and working it out in a practical way, resulting the next year in the establishment of workshops for instruction in connection with the Massachusetts Institute of Technology in Boston. In the workshops of this famous school there still hang to-day the original Russian models of the year 1876 and remind one of the very beginning of the practical, technical instruction which has since made such remarkable progress in America.

The next important step was the introduction of this instruction into the high schools, that is, the institutions which nearly correspond to our *Realschulen* and are intended for the training of the youth from the age of fourteen to eighteen. There are three types of this kind of schools: first, the classical high school; secondly, the technical or manual training high school; thirdly, the commercial high school. The second type is the one which concerns us in our discussion. The first school of this kind was founded in St. Louis in 1879 through the influence of Dr. C. M. Woodward, Professor in Washington University.

Since that time their number has increased with such remarkable rapidity that as early as the year 1901 there were two hundred and thirty-two. In a number of the states of the Union it is required by law that every town of a certain number of inhabitants shall maintain courses in manual training in connection with its public high school.

Concerning the organization of manual training high schools the most necessary facts will be given later.

Even if they are regarded at present simply as institutions which offer general training, yet there is an obvious tendency to transform them into preparatory schools for the technical college, and it is very probable that in time the higher technical training of engineers will be uniformly regulated, and the technical instruction of the secondary school will be required as a necessary preparation for it. On account of the high esteem in which the American generally holds practical efficiency, and on account of the peculiarity of the conditions there, which makes a practical apprenticeship in workshops almost impossible, the schools must offer instruction in workshops on the largest scale, and for this reason it is everywhere highly appreciated. Moreover, the need of technical training is so great that there is a demand for it in every calling, and institutions for technical instruction meet a pressing need.

But from still another direction a strong impulse has been given to a surprising development of everything which is included under the name manual training, and is felt in the several grades from the elementary school to the college. This second source of strong influence in favor of manual training is found in the realm of pedagogy. It

is known that the most important auxiliary science of pedagogy, psychology, is studied in no other country so zealously as in America. But psychological research has led to the fact that all development of the brain and of the purely intellectual functions is dependent upon the development of the senses and of the muscular system, especially upon the training of the eye and hand. Therefore psychology demands a thorough consideration of the elementary technical exercises for the purposes of education; this must begin in the kindergarten and in the elementary classes and must be carried on in a systematic way in all the grades in order to develop the intellectual functions, which are inseparable from the activity of the hand. Moreover the social and economic conditions, which have entirely changed, require the introduction of these activities into the school, because the complete transformation of the entire system of production by the use of machines and the elimination of the most important productive work from the activities of the household and their removal to the factory, have caused the growing child of the present day to lose a great many educative influences, which a few centuries ago were still felt. On that account the education of the school must include these, and thus make reparation for that which is lost. This can only be done by the introduction of practical instruction in the activities of the household and in the problems of the workshop. Wherever the school offers this kind of instruction, not only as a new course, but as a principle which must penetrate through and embrace all instruction, it is fit for the task which it has, or ought to have, in the social life of the present.

Arising from this fact, a pedagogical tendency has developed which seeks the development of a form of training in handwork which will correspond to theory. The principal representative of this tendency is John Dewey, and among the schools which are built upon these principles may be mentioned especially the School of Education in Chicago and the Horace Mann School in New York. Further particulars concerning the organization of these schools will be given later.

Along with the two tendencies previously characterized, which are based, on the one hand, upon the exalted appreciation of technical training in itself, and on the other hand, upon the recognition of the pedagogical significance of technical exercises, there has developed in the practice of the American schools a third tendency, which to a certain extent keeps the middle course, and tries to adapt itself to the technical, without forsaking the customary school forms. The representatives of this tendency are convinced of the value of instruction in work and are attempting to develop it in the schools of different kinds, partly in connection with other subjects of instruction, particularly with instruction in drawing and with the practical work in the laboratories of physics and chemistry, which are given a much larger place in the American schools than with us. The branches of work and the methods which are used in instruction are quite numerous; in some respects foreign influences can be recognized; but in others, independent paths have been followed, for example, in New York where in a number of public schools the experiment has been undertaken of having instruction in work combined, according to modern principles, with the instruction given in drawing, the founda-

tion of an effective, artistic education. The unlimited freedom which is afforded the American schools for experiments, has led to great multiplicity of forms of instruction in work, of which the educational exhibit of the different states and towns in 1904 at St. Louis gave the best idea. This multiplicity is so great that it seems scarcely possible to give a general characteristic of the instruction in work carried on in the public and private schools, but, in any case, it is worth while noticing several figures, which have been ascertained concerning the spread of the work. In the year 1890 manual training was carried on in the schools of 37 cities, in 1901 the number of cities had risen to 232, and in 1902 to 270, and since then it has grown in at least the same progression. In the year 1901 there was spent for manual training in 163 schools, in which 49,369 pupils were instructed by 1,559 teachers, the sum of \$1,160,346. Even if corresponding figures from European countries cannot be placed over against these figures, yet their language is in itself eloquent enough.

If we still try to find the place which instruction in handwork occupies in connection with the pedagogical tendencies now standing prominently in the foreground of interest, the attention must be directed particularly to three of these tendencies: the psychologic-pedagogic, the social-pedagogic, and the art-pedagogic.

That these three tendencies are especially worthy of notice, no proof is needed for him who has in mind, above everything else, the practical results of our education. We are to learn, not for school but for life, and all training should tend to make the person useful for life. For this reason it is necessary to test all aims and means of

education by asking in what way they are efficient with reference to the connection between school and life, and with reference to the education of the individual for becoming a member of the social community. But all pedagogues who comprehend education from this point of view must also consider whether instruction in handwork belongs to the means which will contribute to provide a more effective training and a better union of the school with life.

The psychologic-pedagogic tendency is endeavoring to solve this problem while it tries to conform to the laws by which the intellectual development of the person is accomplished. It follows up the impressions of the senses, which mainly arise through activity of the physical organs, on their way to the central organ, and from this center it follows up the impulses of the will which set the creative organs in motion; it arises from play, which for the growing person is the natural school of work, and it tries to direct voluntary play into regulated but often wearisome work. The more the danger exists in the case of a majority of our young people of allowing the inclination for physical activity and the joy of using the hands to be suppressed because of unhealthful conditions, such as are caused especially by our life in large cities, and the greater the intellectual tendency of our schools, with their high aims in teaching and their extensive curricula, claims in a one-sided way the energy of the youth, so much the greater becomes the need of instruction in handwork. Its significance in education is especially noticeable in cases where training is made particularly difficult by intellectual and physical defects, as in the schools for the feeble-minded. Here the psychologic-pedagogic tendency first recog-

nized the value of handwork as a means of training and has made it serve this purpose to a high degree. The experiences of the schools for defectives are gradually carried over into other fields; attempts are made to diminish the difficulties of instruction especially in the first school years by utilizing the activities of the hand as an aid. Thus we see a return to the ideas of Friedrich Fröbel who made self-activity, the development of the creative powers of the child, and joy in work the main thought of his education. Without doubt further progress will be made along this line and constantly new systems of instruction and more advanced methods of teaching will be undertaken by means of the application of these principles. The tendency, already clearly visible, toward a transformation in the teaching of the natural sciences according to the inventive method, in which experimenting on the part of the pupils themselves is a vital factor, belongs to this movement; as does also the reform of instruction in drawing, and that of instruction in the modern languages which ignores the old forms of grammatical exercise and uses a method which permits the pupil, so to speak, to experience directly the spoken language and to acquire it by speaking it. It is evident that instruction in handwork for boys and in housekeeping for girls corresponds perfectly to this general tendency in the transformation of our school curriculum; indeed, there can be no doubt that the introduction of the workshop into the school is the beginning of a thorough transformation of our system of education. In the educational exhibit at St. Louis there was shown in a series of artistically arranged transparent pictures the education of the different historic periods; the gymnastic development of the Greeks, the schools of the middle ages,

those of the philanthropists and of the great educators of modern times were also shown by means of characteristic pictures. The last picture represented education in the twentieth century—not a school class, but a school workshop; not a school for study, but a school for work, the boys working with saw and plane, and the girls handling sewing materials and cooking utensils. Undereath it the words were written: "Education in the Twentieth Century—Recognition of the Necessity of Training the Eye and Hand as well as the Mind." Herein lies the kernel of all the endeavors of the psychologic-pedagogic tendency, which from inner necessity requires instruction in handwork, in whatever form it expresses this demand.

The second tendency, the social-pedagogic, leads in a shorter way to the same goal. According to our ethical ideas, a commonwealth cannot exist without the work of the individual in the service of the whole, just as a gradual steady development of humanity is not conceivable without serious work, which is performed by the individual within the whole. The higher the culture of a people, the more is work exalted, and it is certainly not a good sign for our German civilization that in our education, training toward a respectful regard for work, especially physical work, is almost wholly lacking. People who are ashamed of handwork do not fully comprehend culture. Education which inspires respect for work and a will for work is a direct means of keeping a high standard of culture, because it compels the wealthy to share with the needy in efforts to obtain culture and in the distribution of it; and even the commonest laborer, who performs the most menial service, ought to have the consciousness that he is doing it for the community as a whole

and that by means of that work he is gaining for himself the place to which he is entitled within the whole. "Education for work" and "Education through work" are the two cardinal points, around which social pedagogy finally turns. The greatest thinkers and poets of all times and peoples have recognized this fact, and each one has expressed it in his own way. The Scriptural exhortation, "Work and pray," places work on as high a plane as the injunction of our Goethe:

*"Wem wohl das Glück die schönste Palme beut?
Wer Freudig tut, sich des Getanen freut!"*¹

But the most majestic song of work has been sung by Thomas Carlyle, the words of which run, "There is a perennial nobleness, and even sacredness, in work. The latest Gospel in this world is, know thy work and do it."

A very persistent demand for instruction in handwork has grown up in the course of the last few years along with the art-pedagogic tendency, which, arising in the Association of Teachers at Hamburg, has been widely accepted. This tendency is an integral part of the civilization of the present age. And since it has been recognized with chagrin how devoid of art our people have become, an attempt is being made to usher in a new period of artistic culture. The *Kunsterziehungstage* (Associations of Art Teachers) have made the solution of the problem of the art education of the German youth their task, recognizing "that the art feeling of a people can flourish only

¹ Upon whom does fortune bestow the most beautiful palm? He who works joyfully receives the greatest pleasure from his work.

when we awaken the art faculties of coming generations and develop them as much as possible." For "to educate artistically" means not only "to make capable of appreciating the noble joy of living," but has at the same time the thought of arousing and developing the artistic-productive powers which are of value because they can produce something worth while.

Experience teaches that artistic training cannot be given by means of lessons in the history of art and by lecturing on works of art, but above everything else it must be done by attempting to bring the pupil into personal relations with art. This comes about most surely by his own activity in some field which stands close to art and which leads finally to art. "Unless we are convinced that modeling must have a place in the elementary school, we shall secure no foundation for artistic training. The conception of form and space is the indispensable foundation of all comprehension of nature in the artistic sense; the development of form concepts at home and in the school is much more important than quiet observation or even premature imitating of graphic copies." (Cf. the work of the art historian, Professor Schmarsow, *Unser Verhältnis zu den bildenden Künsten*, Our Relationship to the Plastic Arts, Leipsic, B. G. Teubner's Publication.) As a matter of course, the significance of drawing is not depreciated by this fact; instruction in drawing and practical work complement each other, and whenever the reformers of instruction in drawing point toward a careful study of nature as the foundation for the entrance into art, their efforts will be followed by instruction in modeling, which completes and strengthens the instruction in drawing.

It is not the purpose of the school to train artists, but to train a people which will possess understanding and love for the creations of art. That is certainly a task of the highest significance for the school. At one time a strong feeling and a real demand for art manifested itself in many parts of Germany; but aside from a few pitiful remnants which have been preserved here and there it has been lost. In a few mountain countries works of artistic value are still to be found in the homes of the peasants, and in Lower Germany, likewise, remnants of native art still attract the collector and friend of art. But the great mass of the people has become entirely alien to art, and even the fundamental technique of handwork has been lost; it has had to give place to machine work, to production in large quantities. Instead of solid, genuine work, we find false ostentation, imitation, and trash. Not the excellence of work, but its cheapness is the desideratum, and with many people, even in the circles of the educated, the feeling for good workmanship is entirely lost. To acquire this feeling again and to win back art for the people will be an important task for the future. The first thing which must be accomplished toward this end is the training of the perception and practice of the eye and hand. Technical work must be recognized in its true significance and, first of all skill must be striven for, because "art" and "skill" go hand in hand. The simple technique of our pupils' workshops is the basis for technical skill; the boy who has worked earnestly at the planing bench, who has forged iron and has modeled clay, will have acquired not only a trained eye and a practiced hand, but also an appreciation of the technique which is adapted to the material. His eye is sensitive to the harmony of conditions; he recognizes

in the simple form the purpose for which it should be used, and in the solid material the value of the object. Under these circumstances the simplest object of utility becomes a work of art, as the pictures and wood engravings of the old masters, of Dürer, Rembrandt, and many others, show clearly. All of these masters had arisen from handwork. In fact, art rests absolutely upon handwork. The best artists of the present time have seen this clearly and have turned back to the practice of the pure technique of handwork, so that Goethe's thought now seems to be verified again: "*Allem Leben, allem Tun, aller Kunst muss das Handwerk vorausgehen, welches nur in der Beschränkung erworben wird. Eines recht wissen und ausüben, gibt höhere Bildung als Halbheit im Hundertfältigen.*" (Handwork, which is acquired only in a limited way, must precede all life, all activity, all art. More culture is gained by learning how to do one thing well than by attaining mediocrity in a hundred pursuits.)

CHAPTER III.

INSTRUCTION IN HANDWORK AS A MEANS OF EDUCATION OUTSIDE OF THE SCHOOL AND IN INSTITUTIONS OF A SPECIAL KIND: PUPILS' WORKSHOPS, BOYS' HOMES, BOARDING SCHOOLS, ETC.

One of the most important instincts of human nature is the instinct for activity. It expresses itself in the child in many different ways: as caprice, propensity for destruction, and mischief, whenever it finds no satisfaction; and as a valuable aid to education when it is employed in the right manner. It finds its natural satisfaction in play, and accordingly, it is one of the tasks of education to develop and direct the instinct for play. Gradually then, work which is systematically arranged will have to take the place of play. With the close relationship of play and work during childhood, it must not be overlooked that certain dangers lie in the complete extinction of the differences between these two, even if, during the period of childhood, direct opposites do not exist. The child takes his play with thorough seriousness, and he is never more industrious than when he plays. At first, then, play and work are of equal importance in his education. But one difference always exists: play is voluntary and work is required. The true art of education consists of taking the play as seriously as it deserves, remembering that it is the most important expression of the child's in-

stinct for activity, and of so arranging the work that it will be done by the child with the same joy and with the same zeal as play.

When in education we speak of work we probably think, first of all, of study, of head work. The significance of handwork in education is often wholly overlooked and in many families children grow up who never experience the blessing of handwork in itself. The importance of the influence of social and economic conditions in this respect has been taken up elsewhere. Whether the school is responsible for these conditions and if so, how far, may be set aside for the present, but the dangers and injuries which have arisen from the complete neglect and disregard of handwork in education we dare not overlook. The history of pedagogy teaches us also that none of the great educators have overlooked it, even though each has had his individual idea of the value and significance of instruction in handwork. The movement for the introduction of instruction in handwork into education, which was ushered in by Rousseau, the Philanthropists, and Pestalozzi, and was revived in the second half of the last century, has led essentially to a development which has made its way outside of school education and has expressed itself in private institutions. Yet it has kept its pedagogical character, partly for reasons which lie within itself, partly also because the beginning of the movement lay, fortunately, in the hands of teachers.

Inspired and aided by the German Society for Boys' Handwork, which was organized twenty-five years ago, schools for handwork for boys have sprung up in all parts of Germany which, either entirely independent of the school or only in loose connection with it, give opportunity

and training in practical activity. Since these schools for handwork (pupils' workshops) number at present about one thousand, and many of them have hundreds, in fact, in some of the large cities, even thousands of pupils, their significance in the education of the German youth must not be underestimated.

The private character of the overwhelming majority of the pupils' workshops offers, aside from certain disadvantages which should not be misunderstood, above everything else, the advantage of a free development not hampered by bureaucratic influences. Therefore, they present a rather varied picture in their external equipment as well as in their curriculum, methods of teaching, subjects of instruction, etc. At present the following subjects of instruction are the main ones offered: elementary handwork; pasteboard work; work at the planing bench, and other exercises in wood, especially carving; work in metal, and in connection with it, the construction of equipment and apparatus to be used in teaching. Recently, in connection with the efforts toward training in art, which have already been mentioned, modeling has come more into the foreground. The significance of this in the teaching of drawing is universally recognized by the reformers in this line of work. However different the kinds of work named may at first appear, yet the same thought lies at the foundation of all, and, upon this their significance for education depends: instruction in handwork is to develop and strengthen the talents of perception and observation and make the hand capable of constructing out of given material something which will serve a definite purpose. Instruction in drawing has the same end in view. But while here the representation executed

by the crayon or paint brush must be limited to a flat surface, instruction in handwork has at its command much richer material for representation. The material which is available for use in construction is quite varied, and offers in its manifold characteristics an abundance of matter for observation and instruction which can be supplied in no other way. The tools which the pupil learns to handle are most diverse, and require, therefore, the exercise of groups of muscles which would otherwise remain inactive, and consequently would not be developed. The making of the objects follows in the course of time, and stimulates the development of the sense of form, affords opportunity for the application of the fundamental principles of mensuration, and for the development of individual skill, upon which all effective work depends. Every boy who tries it will find that the construction of any piece of work is not a simple and easy task, and, moreover, is not a thing which can be accomplished without consideration, accurate observation, and energetic action. There is no better means than this for guarding against the undervaluing of handwork, which is very dangerous, and also for developing in the children of aristocratic rank a social sentiment which must express itself in esteem for every active and capable member of human society. The reproach is often justly made against our school education that it fails in training the pupil to respect work, especially physical work, which is often only held in scorn. The American attitude, on the other hand, is often commended because it demands that no one be ashamed of any work whatsoever. The correct valuation of practical work, which exists not only in the consciousness of the American people, but has long ago entered into their sys-

tem of education as well, gives the American people not only a moral, but also an economic superiority over peoples that fail to recognize the value of work, especially physical and handwork.

Instruction in handwork has a social significance in still another direction; it shows the pupil repeatedly his dependence upon others and gives him occasion to give and receive help. Often the division of work leads to a sort of partnership in work, in which differences of rank are quickly forgotten, and it offers opportunity for the development of the social virtues—something which is too often neglected entirely in our age. In many places it is recognized as a particular advantage of our pupils' workshops that they offer to the children of different rank and from schools of different grade the opportunity of working together; and moreover, the opportunity of learning to know each other. With the sharp separation into social classes which, under our educational system, has been carried out even for the youth, the significance of pupils' workshops even in this respect cannot be overestimated. The youth, at any rate, should be spared as much as possible the division into professional ranks and classes of society which are unavoidable in later life, and he should be able to occupy himself with a childlike partnership in work just as in play.

The vital educational force which, as has been indicated in previous pages, is in very large measure characteristic of instruction in handwork, is effective, as a matter of course, not only in the pupils' workshops, but, most of all, in homes for boys, boarding schools, and similar institutions; especially is it here a matter of directing the instinct for activity in the right direction, of developing the will

power, and of training individual characteristics which are of value to the person in life. As a matter of course, this can occur only by paying attention to the general principles of education which apply to all instruction and which are of special significance in instruction in handwork for boys.

Above all, it is required that such problems be selected for each grade, as correspond to the intellectual and physical ability of the children. Spending too much time on simple exercises would be as injudicious as proceeding so rapidly that the difficulties mount up and exceed the child's powers. The introduction of new tools and materials must proceed step by step, since, according to experience, the new always offers a certain charm and by means of it the interest of the youth is sustained. This interest is even increased by choosing objects to be made which can be completed in a comparatively short time, and which, as far as possible, are useful. In this lies, as we might remark in advance, the superiority of the concrete Swedish system to the more abstract French system, in which the pupils are limited mainly to the making of objects merely for practice.

In the construction of objects, of whatever kind they may be, a purely mechanical imitation (copying, tracing, and the like) should not be allowed; on the contrary, every thing which is to be executed should be independently laid out according to the rules of drawing and geometry. Only in that way is the pupil trained to an active sense of form and space and only thus is his taste developed. In any case, an effort must be made to stimulate him to thoughtful work; therefore the teacher must not give any more help than is actually necessary for the

solution of the problem. The customary procedure, still prevailing in our pupils' workshops, of giving the pupil the form and size of the object to be made, is not in keeping with this requirement. The form arises from the purpose of the object. From this the conclusion may be drawn that the simplest form, and that which best conforms to the purpose for which the object is constructed, is, as a rule, also the most beautiful. In any case, let the pupil be encouraged to find an appropriate form himself. The simplest form which he himself finds, has doubtless more value for him than the best which could be given him. Similar principles also apply to all decorative forms and ornaments applied to objects. Above all, it should be taken into consideration that an ornament may be applied only where there is really something to adorn. The customary overloading with much amateurish art, which in accordance with the principle "Adorn thy home," endeavors to make use of ornament in everything, even in inappropriate places, must not gain ground in our pupils' workshops if they are really to contribute something to aesthetic education.

The general principles governing instruction in work cannot, however, differ essentially from those of other branches of instruction. The finished object, the discussion of which is aided by models and drawings, will always form the starting point for undertaking a new problem. In the work itself the chief thing consists in pointing out and in improving upon previous mistakes; the less that is said while at work, the better. Karl von Raumer was perfectly right when he said that it is a silent, practical wisdom which dwells in workshops; this silent wisdom must, as a matter of course, also govern our instruction.

For the teacher of practical work it is not the principal thing to be a master of words. "We need skillful, trained hands more than ready tongues," as Liberty Tadd says.

The question as to whether instruction in handwork should be class or individual instruction needs to be touched upon only briefly here. As a matter of course, the more instruction can be individualized, the more easily can it do its work; that is true of instruction in handwork just as of any other kind of instruction. But that is not saying that it cannot be carried on as class instruction. This very assertion has often been brought up as an objection when the question was raised of introducing handwork for boys into the school. We shall have to come back to this objection again in a later section; if it is a matter of carrying on instruction in handwork in pupils' workshops and educational institutions, it does not seriously enter into the question, since in institutions of that kind the sections of pupils can be formed in a way that is best adapted for the purpose of instruction.

We shall turn now to the consideration of the subjects of instruction suited to the different ages of the pupils, and keep in mind particularly those which have been recommended by the Institution for the Training of Teachers in Leipsic, and which on this account have gained for years a foothold in our German pupils' workshops. The German Society for Boys' Handwork has established normal courses for the most important of these subjects of instruction, which have been worked out by experts and based upon their experience in different places, and these offer a reliable foundation for carrying on instruction. It is taken for granted that by making use of these courses

one is not to consider himself bound in details, but rather to utilize them in a sensible adaptation to given conditions.

For the younger pupils who are found in our pupils' workshops—as a rule those from six to nine years of age—problems in elementary handwork are suitable. These form a transition from play to work and rest essentially upon the gifts suggested by Friedrich Fröbel for the little ones in the kindergarten. The children are to learn first measuring, comparing, estimating, cutting, and to exercise the hand and eye by means of the simplest things. Paper, cardboard, twigs, and thin wood for fret-saw work constitute the simplest material; scissors, knife, rule, fret-saw, hammer, and pliers, the tools. By means of the work the fundamental geometric conceptions (corner, triangle, square, etc.) are formed, and the little hands are practiced in making simple and pleasing forms. It is evident that of all the kinds of activity for this stage modeling is especially suitable; that is, imitating in clay or plasticine. Children who are left to their instinct for play select this way themselves: they model in the sand and knead the moist earth. Our pupils' workshops direct this instinct for play into the right paths and utilize it as the foundation for object teaching which is infinitely superior to the customary object teaching. Franz Hertel has pointed out the way to it in his work, *Der Unterricht im Formem als intensivster Anschauungsunterricht* (Instruction in Modeling as the Most Intensive Form of Object Teaching, Gera, Publication of Th. Hoffman.) We shall have to come back later to the significance of this instruction in modeling and the service which it can render in the first school years.

Work in paper of an elementary character finds its con-

tinuation in the work in pasteboard which is adapted to the children from ten years on, and can be extended up as far as desired. The chief value of this work lies in training in form concepts (through the construction of boxes and the like) in practice in drawing with instruments and in the formation of taste through the selection of good proportions and colors which harmonize. Pasteboard work is, moreover, an excellent means for training the pupil in accuracy and neatness.

The simple woodwork in the elementary stage is a good preparation for the work at the planing bench, which ought not as a rule to be commenced before the twelfth year of age, since the difficulties in this kind of work increase in every direction. The material is firmer and, therefore, requires a greater measure of physical strength in working it; the tools are more varied and more difficult to handle. Consequently the work becomes, according to the opinion of a well-known hygienist, "gymnasium work with tools," in which the work is not done with physical strength alone, since a certain skill must enter in, which is necessary in handling the tool in a way that is best suited to the end in view. In this work the hand and eye complement each other; the execution remains incomplete if either one of these organs does not meet the requirements for its task. Upon this rests the unique, high value of this work which, in this respect, cannot be replaced by any other work. Besides, the adaptation of the material gives the pupil an opportunity to learn to know through his own experience the relation of form to the structure of the material. After gaining this knowledge, the way is paved for understanding the most important fundamental laws of all artistic execution.

The elementary knowledge of the simplest forms of wood construction which are so fundamental from the technical point of view, is also given in our pupils' workshops; likewise an understanding of the aesthetic motive which is called into service in the decoration of simple pieces of work by means of staining, coloring, or carving. If the principle is maintained that the adornment should conform to the laws of true art in handwork, the boy will be led through the practical work to a correct appreciation of the art in unadorned handwork, which in our times has been almost lost, and which we must acquire again for future generations.

Consequently, woodwork proves itself most valuable in different directions. To be sure, there are also connected with carrying on this work certain difficulties which consist principally in the fact that only a limited number of pupils can be taught at one time, and that the equipment of the workroom is tolerably expensive. In places where conditions do not permit the expenditure of larger funds, the use of benches for planing must, therefore, be dispensed with and the woodwork be limited to such exercises as can be performed at ordinary work tables with simple tools.

Most important of the kinds of work which can be done with this equipment is carving, which to be sure, can scarcely claim to be an independent form of technique in itself, and yet is carried on in many places as the only woodwork. Chip carving, a very old and widely extended form of decorative work, has fallen recently somewhat into disrepute, not without reason, since it has been much abused by too frequent application, and especially in forms which are not beautiful, and by extreme

minuteness of the carving. It is, however, falling into the opposite error to wish to do away with chip carving on that account, for, applied with moderation and skill, it doubtless produces beautiful effects, which can be increased by the use of surface carving and line carving. The latter forms of technique offer the advantage of permitting also a limited use of plant forms. As a matter of course, the effect of the ornamental work can be increased by means of color and stain or it can be completed in still another way; for example, by inlaying.

The relation of the ornamental work, which we have just mentioned, to instruction in drawing must not be overlooked, even though its connection with instruction in drawing can be maintained only with difficulty in workshop instruction carried on outside the regular school. This difficulty arises on account of the variety of the preparation of our pupils; other factors also enter in to make the difficulty still greater. The pupils themselves place value upon practical work above everything else, and since their participation in it is voluntary, their wishes must be respected as far as possible. In places where instruction in handwork is fitted into the curriculum of the school, special stress must be placed, as a matter of course, upon the inner relation of it to the instruction in drawing. As a subject of instruction which is able to offer especially valuable services in this connection, modeling should be mentioned.

Modeling had not enjoyed great popularity before. One reason for the indifferent attitude of our youth toward this kind of work was to be found in the fact that it furnished no directly useful products. But doubtless the prevailing method by which modeling was carried on

contributed to this result, and as in the case of instruction in drawing, the interest of the youth has developed in an unexpected manner, by the introduction of the so-called reform method, so a gratifying change in the application of instruction in modeling has come in since the reform in that subject.

Since the geometric and ornamental forms which were formerly used have been given up, and the modeling of objects from nature from the very beginning have taken their place, a largely increased interest in modeling has been awakened. In the Institution for the Training of Teachers at Leipsic this method has been in use since the year 1902, and the results obtained from it are so convincing that there can be no longer any doubt concerning the possibility for development which exists in instruction in modeling. For closer confirmation of this assertion reference can be made to the reports of the institution just mentioned. If the matter is taken hold of correctly, the introduction of modeling into the workshops for the youth will be established, and it can scarcely be too urgently recommended for reasons which are universally considered educational. No other activity demands in so high degree a feeling for form as modeling; no other material is so plastic as clay; and in no other work does the hand affect the material in such a directly formative way. The importance which modeling has in general, and especially with regard to particular subjects of instruction; for example, with reference to instruction in the natural sciences, cannot be too highly estimated. (In this connection see *Die Bedeutung des Modellierens für den naturgeschichtlichen Unterricht*, The Significance of Modeling in the Instruction of Natural History, by Dr. A. Pabst,

in *Natur und Schule*, Nature and School, 1905, Number 9, Publication of B. G. Teubner in Leipsic.)

The technique of metalwork has been developed as a subject of instruction in the pupils' workshops and has been introduced in several places. But even the material equipment (arrangement of the workshop and such matters) causes many kinds of difficulties, and the work can be carried on successfully only with older pupils under well-trained teachers. With reference to the educative value, the technique of metalwork is scarcely inferior to that of the work at the planing bench. The resistance to be overcome in working up the tough and firm material makes demands upon the strength of the boy which can only be met by an energetic will and a skillful hand. But, on the other hand, the characteristics of the metals, appearing in connection with the work, also arouse the interest of the youth to such a degree that, almost without exception, they esteem this kind of work very highly. It is necessary only to suggest the operations of hammering, drilling, soldering, and tempering of steel, to show clearly, without further explanation, the value of metalwork in the education and training of the older boy, since these operations offer at the same time an abundance of theoretical teaching.

Metalwork can be developed on its practical-technical side, or it can just as easily be brought into connection with the instruction in physics. The older boys who, along with a knowledge of the simplest technique of metals, have had some practice in working with wood and paste-board, can be successfully trained to make simple physical apparatus and other equipment for teaching. By this means handwork helps the instruction of the natural sci-

ences, and thus, we shall be led to the necessity of making it a part of the curriculum of the school, especially of the higher school and the *Seminar* for teachers. Further statements concerning this question will need to be made in another place. For the completion of the foregoing exposition, reference will be made briefly to several points of view which cannot be overlooked in making up our judgment of the educative value of skill of hand.

The greatest value is that of accustoming one's self to independent thought and action, a thing which must be required of everyone who wishes to complete any practical piece of work. Unsuccessful attempts are accepted from no one; so much the greater then is the joy in final success. Without careful planning and work aiming toward a definite goal, no satisfactory result can be reached. Even in deportment strict order must be observed and every offense against this avenges itself. The greatest economy in the use of material, and care in the handling of tools is enjoined as a matter of course, and at the same time quickness of perception is stimulated, which makes each person capable of helping himself in the most direct way. In the workshop the pupil finds recreation after intellectual activity, and a stimulus for voluntary achievement. The activity of the workshop is, consequently, one of the most important means of education. To what extent and in what way it is to be organized will be determined by the given conditions and can therefore not be described in further detail here. This will depend essentially upon whether the training of the children takes place in town or in the country, in the family or in an institution. Training in institutions depends, moreover, upon the varied character of the pupils; for example, those

who are deprived simply of the care of parent (orphans' homes, homes for boys, institutions for protection and training), or those who stand in danger of neglect (rescue homes and institutions for compulsory education), or those who are afflicted with physical and mental deformities (institutions for the deaf-and-dumb, and for the blind, and institutions for idiots, etc.)

In the great majority of all these institutions, instruction in handwork is more or less extensively carried on; several of them, as for example, the *Erziehungsheim am Urban* (boarding school, "*Urban*," for lost children) in Zehlendorf near Berlin, which is excellently conducted, are thoroughly organized on a plan of a training school for handwork. Also the modern *Landerziehungsheime* (rural boarding school) of Dr. Lietz,¹ and other similar institutions in Germany (for example, Dr. Kapff's training school), and in foreign countries (for example, Palmgren's *Samskola*, and the Swedish workrooms, the American vacation schools, and the institutions for training of negroes and Indians, etc.), make use of handwork in a most extensive way as a means of education.

¹ This school is of the type of the one at Abbotsholme in England.

CHAPTER IV.

INSTRUCTION IN HANDWORK IN THE SCHOOL (SCHOOLS FOR DEFECTIVES, VOLKSSCHULE, AND HIGHER SCHOOL) AND IN THE SEMINAR FOR TEACHERS.

The consideration of instruction in handwork "in the school" proceeds best from the school for defectives, the youngest member of the system of the *Volksschule*. The school for defectives deals with children who, on account of deficient intellectual capacity, which is caused by physical deficiency, are not fitted for the school for normal children. Although these children were formerly abandoned to their fate, in the last decades special attention has been devoted to their education and these efforts have in general met with success in training them to be useful members of human society. As an essential means, without which the attainment of the goal is not possible, instruction in handwork is recognized and consequently introduced almost everywhere into the curriculum of such schools. The conviction that it is indispensable in these schools is constantly gaining more ground; theoretic considerations lead without hesitation to this conviction and practical experience confirms it.

Imbeciles or children who are actually feeble-minded, along with a deficient development of the organs of sense, frequently show disturbances in movement, weakness of muscles, and a greater or less lack of life energy. By this

a sufficient amount of exercise of the physical organs is hindered. Through this lack the development of the nervous system is injured, for the development of the brain and nerve paths is dependent upon the activity of the muscles and nerves. The training of all the functions which in the normal child have developed before the school years by means of play and other activities, has remained so far behind in the feeble-minded child that the instruction entered upon at the beginning of the school period must first take up all that which has been developed in the normal child before the school age. The first task of the instruction of the school for defectives will be to equalize as far as possible the deficient development of the physical and intellectual functions in the organism and to remove the disturbances which have been caused by hereditary influences or by unfavorable environment. The largest part in this treatment will have to fall upon the development of the physical side, for only through physical activity can the foundations be laid which are necessary for the intellectual development. Through the exercises of the organs of motion and sense the brain is trained. If, as a result of deficient development of the organism, the inner impulse for such exercises is lacking, the stimulus for them must be supplied from outside. The instruction of the schools for defectives must begin then with exercises for the organs of sense and muscular activities in order to create in the first place a foundation for the further possibility of training.

The psychic impressions which are gained through the activity of the physical organs are indispensable for the development of the human mind. In authenticated cases, (Laura Bridgman, Helen Keller, and others) in whom

the inability to see, hear, and speak seemed to prevent almost any possibility of further intellectual development, this could be attained only through the exercise of the muscular sense. The muscular sense, that is, the power of perceiving location and movement, is, on that account, almost the chief sense for the development of the soul, and the more this is rendered difficult because of the natural constitution of the child's organism, the more must the development of it be emphasized.

Although for reasons which are derived from the laws of development, the exercise of the physical organs has to begin with the movements of the larger muscles, yet these soon lead to the development of the finer movements which are performed by the hand and fingers. But the training of the hand is especially important. Let us first consider the development of sight. It is only by means of the groping hand, which assists the movement of the eye, that the comprehension and distinction of surfaces and bodies become possible. (Goethe: "*Sehe mit fühlendem Aug', fühle mit sehender Hand.*" (See with the feeling eye, feel with the seeing hand). In order to train, especially the feeble-minded, to see correctly, the hand must be developed by means of a series of exercises which force the eye to activity. Furthermore, the hand must be considered as an essential organ for the expression of thought. In the history of the race the gesture was the original form of expression from which speech developed, and if we accept the theory of Baldwin that the development of the spoken language is connected with right-handedness, then it is proper to refer to the latest utterances of Flechsig: "We can even now say with reasonable certainty, that object teaching and physics use constantly both lobes of

the brain, likewise instruction in gymnastics and handwork. On the other hand, everything which has to do with spoken language, for example, writing, reading, arithmetic, etc., is performed mainly in the left lobe of the brain." In the practical work of the school for the feeble-minded, courses of instruction in handwork have proved to be necessary. This is also seen from still other points of view. For if, in the history of the race, the training of the hand preceded that of speech; then the development of the hand may be regarded as a necessary foundation for the development of speech. Upon the activity of the hand, then, the beginnings of casual thinking and the development of the will are dependent, and consequently the conclusion may ultimately be drawn that much depends upon the training of the hand.

We desire to refer only incidentally to the practical significance which instruction in handwork has in the school for defectives, although we recognize that it contributes essentially in training up the feeble-minded children to be useful members of the community.

If for the sake of connection the theoretic reasons previously given for the significance of instruction in handwork in the school for defectives could not be omitted, then its chief value might be presented by means of a few suggestions with reference to development of the practical work of this branch of instruction. Handwork has already been attempted in many schools for defectives. Whether these attempts have always been made with correct insight into the significance of instruction in handwork in the pedagogy which concerns itself with defective pupils is, however, a question. The zealous pursuit of this branch of instruction has probably succeeded

more for other reasons. It has been joined as a special course to the other subjects of instruction and an effort has been made to bring it into connection with them without being conscious of its fundamental significance, which in any case demands that it must stand in the central place of the instruction of the school for defectives, and that through it the foundations are to be laid for all other branches of instruction.

Exercises for the larger organs, (gymnastics, gardening, games requiring movement, play in the sand, and the like) must precede the instruction in handwork and must accompany it further. Among the first exercises which are particularly well suited for the development of sight by means of the activity of the hand, is the modeling of flat surface forms, to which are added exercises to develop the sense of color (making cakes of paint, colored dominoes, etc.) Laying blocks, drawing from models, cutting, folding, and pasting in definite forms, weaving with the needle and plaiting are also among the most important exercises for this purpose. The plaiting forms the transition to the representation of forms which are used later in the work of box making, construction work with sticks, cardboard work, modeling, basketry, work with twigs, simple pasteboard work, and the like. For the girls, domestic handwork takes the place of many of these.

It is not possible here to give further details of the curriculum outlined above, and for our purpose it is probably not necessary. The special conditions under which the particular schools for defectives are carried on also necessitates an adjustment of the existing curriculum to the needs of these institutions.

The reasons which have been advanced for the neces-

sity of instruction in handwork in the curriculum of the school for defectives can also be directly applied to the training of normal children. That this has not generally been done up to this time proves nothing against the correctness of this conclusion. The importance of the instinct for activity is probably recognized now by all pedagogues and its cultivation as one of the main tasks of education during the first school years and beyond must be considered. Many, then, who clearly recognize and lay stress upon the significance of the instinct for activity, as soon as the forms of instruction have to be decided upon, come to the astonishing conclusion that the cultivation of this characteristic instinct should be left to the home. The school of today uses only seats. Work tables, on the other hand, and space for work are considered scarcely necessary in our present day method of carrying on instruction. It is a school for learning in which "instruction in language, through reading and writing, plays an important rôle from the very beginning, and not instruction in things with observation and the making of objects." The exercise of the muscles, natural activity, and the motor processes in perceiving, thinking, feeling, and willing, are neglected. Thus the intellectual development is greatly injured, and this system is the cause of practically all of the physical injuries and those relating to the health which, according to experience, are accustomed to appear during the first school years and are included under the name "school diseases." (Cf. Dr. Lay, *Unser Schulunterricht im Lichte der Hygiene*, Our School Instruction in the Light of Hygiene, Wiesbaden, 1904.)

Many admit the deficiencies and faults of the instruction of our first school years without hesitancy, but reply

that it is not possible in our large school bodies and excessively crowded classes to carry on efficient instruction in handwork with success. That the objections raised in this connection cannot hold good is easily shown by more accurate information and an unprejudiced examination of the problem. It is remarkable that the German *Volkschule* is the only school which has absolutely refused to adopt the ideas of Fröbel, yet the instruction of the first school years should be based upon these ideas. The common schools of other countries have accepted them and to a greater or less extent have put them into practice. France, Switzerland, and in a still higher degree, England and North America offer examples of this; the educational exhibits of the World's Expositions in Paris and St. Louis were most instructive in this particular, and when, for example, at the latter a state of the far west (Utah) presented an educational exhibit which emphasized the principle that all instruction must be built upon the ideas of Fröbel, then any further discussion of this fact is superfluous for him who forms his opinion without prejudice.

As a matter of course, the instruction in handwork of the first school years must satisfy the general demands which may be made upon any educative instruction. This implies, in the first place, that it must arouse the direct, active interest of the children. This condition can be easily fulfilled if it is directed toward the construction of such objects as are connected with the instinct in the child for play and with his previous occupations. Simply to perform technical exercises at this stage is wholly unsatisfactory; they are not at all necessary if the technique is so managed that it offers, particularly at first, only slight difficulties. In this connection it should be stated that the

use of tools must be introduced gradually and that those which are employed must be simple and inexpensive. The material must also be simple, inexpensive, and easy to procure, and the kind of occupation must make it possible to maintain neatness and order without special difficulty. In mentioning these conditions a further one is implied; namely, that the process of instruction shall offer no particular injuries or danger to the health (dust, injury with tools, etc.)

We possess forms of technique which meet these demands if used correctly; for example, our problems in elementary handwork—modeling in plasticine or in clay, simple woodwork, and the like. Next to modeling, to which we would, for well considered reasons, under all circumstances, assign the first place,¹ tasks in paper and cardboard (weaving, folding, cutting, etc.) offer very appropriate occupations. (Cf. *Über Notwendigkeit und leichte Durchführbarkeit des Knabenhandarbeitsunterrichts auf der Unterstufe*, Concerning the Necessity and the Easy Execution of Instruction in Handwork for Boys in the Lower Grades, by Mittag, Instructor in the *Seminar*, in *Blätter für Knabenhandarbeit*, 1906, Number 3.) According to experiences in places where instruction in handwork has been offered under the above mentioned conditions, the pursuit of the work in classes furnishes most favorable results and requires an expense which is scarcely worth mentioning. Will a yearly outlay, which amounts to less than twelve cents for each child, be considered a sufficient reason for opposing the introduction of a branch

¹ Cf. Dr. A. Pabst, *Die Bedeutung des Modellierens* (the Significance of Modeling) in *Natur und Schule* (Nature and School), 1905, Number 9, Teubner, Leipsic.

of instruction, the significance and purpose of which are for every other reason desirable?

In carrying on instruction in handwork it must not be overlooked in the very beginning, that it has the closest connection with object teaching, and instruction in drawing; attention must be called especially to the fundamental work by Franz Hertel, *Der Unterricht im Formen als intensivster Anschauungsunterricht* (Instruction in Modeling as the Most Intensive Object Teaching; Gera, Th. Hofmann, 1900.) How far instruction in handwork in the first school year can be brought into relationship with instruction in writing and reading cannot at present be finally determined; the attempts which have been made concerning it at least justify the highest hopes. (Cf. *Blätter für Knabenhandarbeit*, 1906, Number 2.)

In connection with the establishment of instruction in handwork in the middle and upper grades of the *Volkschule*, we have at least in the German schools, little experience to rely upon. Some time ago School Adviser Springer (died 1905 in Bonn) made the attempt in the schools of the district of Neurode in Schleswig to unite instruction in handwork (carving, bench work in planing, and metalwork) with drawing and mensuration in the upper classes for boys. This attempt was brought about by the economic distress of those sections, and is very worthy of attention because of the manner of its execution and its remarkable results. (Concerning it see the *Blätter für Knabenhandarbeit*, 1903, Number 12.) Rector Brückmann in Königsberg in Prussia also unites woodwork and pasteboard work in the upper classes for boys with drawing and mensuration and has recently supplemented the object teaching of the first school years with

handwork and drawing. A combination of instruction in handwork and drawing has also been accomplished by Instructor Parthum in Glauschau in Saxony. With simple means, and yet in a many-sided way, Prof. Kumpa in Darmstadt (died 1905) sought to establish a union of mensuration, drawing, and handwork. These attempts have been continued by Instructor Hilsdorf and by School Inspector Scherer in the *Volksschulen* directed by him in the city of Worms. In these schools his efforts have been turned toward instruction in work as a result of the inspiration aroused by the German Society for Instruction in Handwork. At the congress of this society in 1904 the attempts above referred to were presented in a definite report. (Cf. the Report of the Sixtieth Congress of the German Society for Instruction in Handwork, at Worms, 1904, Leipsic.) Attempts have also been made in the practice school of the Pedagogical Seminary at Cöthen in Anhalt for almost ten years to carry on handwork for boys in all eight grades and to unite it organically with the subjects of instruction in each individual class. (*Blätter für Knabenhandarbeit*, 1899, Numbers 8 and 9.) As the idea of instruction in handwork has for centuries had its advocates among pedagogues, and as it has made its appearance in all civilized countries, so it has spread at the present time in all directions and assumed very different forms of expression, which have by no means been exhausted by our predecessors. Perhaps an illustration from natural science will give the clearest idea of the many-sided development of instruction in handwork. In countless hues the ray of light is broken up by means of a prism. If desired, either seven or three primary colors can be distinguished in it, but the essential thing is, after all, not the color, but the light—the vibrating

movement of the minute particles of ether, which are scattered everywhere and present all the phenomena of the world of color. Thus the essential thing here is not the form and not the expression of the idea in detail, but the idea itself, *the idea of releasing the inborn, creative powers of the child and of developing them through activity, at the same time looking upon the child as a being endowed with physical and intellectual talents, the development of which into a harmonious perfection must be the highest task of education.*

With this we turn back to the goal of education set forth by Pestalozzi, from which the *Volksschule* of the present time, in consequence of its one-sided intellectual tendency, has departed further than ever before. Not only the opinions of school reformers, but, moreover, the practical knowledge of the result, or rather failure, of the training of our *Volksschule*, which has been shown in the continuation school and in life, proves the correctness of the judgments which have been uttered in this regard.

Naturally no one will be of the opinion that, by the introduction of instruction in handwork, a panacea has been found for all the evils of the *Volksschule*; but it is at least certain that this school needs a decided reform, and this cannot occur without taking into consideration instruction in handwork. Therefore this is given its proper place in all proposals for reform in instruction of the *Volksschule*, which are not satisfied with superficial patchwork; for example, Prof. Hagmann in his work, *Zur Reform eines Lehrplanes der Volksschule* (Concerning a Teaching plan of the *Volksschule*, St. Gall, 1904), says: "Instruction in skill of hand offers advantages for the education of child-

ren which are most valuable. Since instruction in handwork has been desired by the most widely differing communities, it would, therefore, be entirely in accord with the spirit of the age to make a new school law, by means of which handwork would be given a prominent place among the school studies." In the *Elementen der Erziehungs- und Unterrichtslehre*, (Elements of the Theory of Education and Instruction), by Prof. Barth, Leipsic, 1906, he says: "Instruction in skill of hand is without doubt indispensable in intellectual and moral development." If we cannot agree with Barth, that handwork shall be satisfied with that which object teaching and the teaching of drawing can offer, because the result of handwork assists them, yet we can support his statement which declares that "the pedagogical and didactic power of handwork has not up to this time been sufficiently fathomed." (Cf. *Barth, Elemente der Erziehungs- und Unterrichteslehre*, page 498.)

Whether the forms which have, up to the present time, been worked out for the practical execution of instruction in handwork in Germany and, to a large extent, in other countries, and which have been in some measure tested, are absolutely the correct ones, we do not say. The last section of the book will give an opportunity of looking at these different forms more closely. He who will not presume like a prophet to look into the future, will have to leave it to the future to give its final decision on the question.

Very much of that which has been said above concerning the significance and the possibility of carrying on instruction in handwork with reference to the *Volksschule* can be applied without hesitancy to the higher school.

The latter suffers in a still greater measure than the *Volksschule*, from the same fundamental evil. Therefore, it can be helped only by the same means. The training of the youth to independence, the necessary direction of his powers toward that which is clear, practical, and important for life, point to instruction in handwork, which, for these reasons, has been established in a number of higher institutions of learning in different German states and cities; and where it is carried on in the right way, it is estimated at its true value. Even though it is still actually treated at times as a stepchild by many directors and teachers—much less by the parents and pupils themselves—being given the lowest place in the rank of studies, standing far below gymnastics and drawing, and not even existing at all for the majority of the pupils, yet we feel confident that even this stepchild will again receive the place it deserves. The reasons for it are too manifold and too important to be entirely overlooked for a great length of time. Prof. Ziegler in his *Allgemeine Pädagogik*, (Leipsic, Teubner, 1901), comments thus: "On this account (that is, for social reasons) it is already a matter for congratulation that the thought is of late constantly making headway, that even our pupils in Latin are to learn and pursue handwork. They will then see that it is not an easy and simple matter—nor a thing devoid of thought, and that in this work they themselves are frequently surpassed by those who have not succeeded on the school bench or who belong to a lower school—simply to the *Volksschule*!" And the philosopher, Friedrich Paulsen, expresses a similar opinion in his *System der Ethik* (System of Ethics, Volume 2, page 50): "Still more

recently efforts have been made to improve the manual skill of the young by giving them an opportunity to train themselves in the use of tools. It is to be hoped that these attempts will succeed. Practical skill is a desirable thing. I am convinced that at least ninety out of every hundred young people who attend our higher schools, would find more pleasure in manual labor than in their school exercises. When nature formed the eye and the hand, she evidently did not intend them to be used in the way which is almost the only one known to our pupils: that is, for reading and writing. The Germans used to be very proud of their mechanical skill; during the fifteenth and sixteenth centuries their cities were renowned above all others for the skill of their artisans. Leibnitz once described the difference between the French and the German nature as follows: 'Frenchmen,' he said, 'make useless things which are simply beautiful to look at, while Germans make things which not merely please the eye and satisfy the curiosity of great lords, but also accomplish something; they bring nature under the control of art and lighten human labor.' As late as a century ago there were places in Germany in which sailors and peasants spent their leisure moments in carving; at present the only things which many a man can handle, besides his knife and fork, are his pen and his cigar. May it not be possible for us to return to our first love? And by doing so we can get rid of the new-fashioned contempt for manual labor, that too will be a blessing; indeed, we should not regret the loss of some of the idealism which, in imitation of the ancients, affects to despise banausic work. I am rather afraid anyhow, that we are not making much headway in Hellenizing our people, and per-

haps we have less reason to regret being honest Germans, than old and new humanists try to make us believe.”¹

Another remarkable utterance of the same scholar is found in a discussion of the system of continuation work :

“The public care for the training of girls in household arts can, in the long run, be dispensed with no more easily than that of boys in all kinds of skill of the hand. Instruction of this kind could be regarded as lying outside the tasks of public education as long as the majority of the children received in the parents’ homes the first training in domestic arts. The families of working people who are engaged in large industries in our great cities fail in this important task on account of lack of time, ability, and opportunity; and with the families of numerous office employees the condition is not very different. So arises the need of offering thru public training what the home can no longer adequately provide. The suppression of the work of children in the factories is certainly justified; but the indifferent interest taken by the state in this matter necessitates that the development of energy for work and skill of the hand should be included among the public responsibilities. In order to bring about a reconstruction of healthy family life, the possession of the domestic arts on the part of the woman is of great importance. A skillful hand also gives to the man greater freedom in choosing a life work and free activity in his leisure hours.”

Along with these reasons which are mainly sociological, there are also specifically pedagogical reasons not to be overlooked by men of the higher schools. Ziegler says

¹ Translation by Frank Thilly, published by Charles Scribner’s Sons, 1900, p. 476, ff.

again in the *Allgemeine Pädagogik*: "Our youth occupied, often overcrowded, with headwork, is assisted in two ways by this (alternation of headwork and handwork). Further, the hand and eye are trained by it. How unskillful are our pupils in Latin! especially the most industrious, who are the most unskillful of all! The judgment of the unpractical scholar has its origin here and is applied then for a lifetime to us all with justice and yet with injustice." He speaks further of the significance which technical work has for the knowledge of the laws of nature: "One learns the inexorable value of these laws only when one is thrust against them in his work, when the brittle material offers opposition here and compels the person to deal with it according to its laws." With these words he has declared in general principles that which has been discussed in detail in numerous special works of the advocates of particular methods of instruction in the natural sciences and that which is to form for us now the starting point for the establishment of requirements which we must make upon the *Seminar* for teachers with reference to practical (technical) instruction.

It is related of Faraday that according to his own judgment, he was not able to understand an experiment completely if he had not performed it himself; and Dühring says in his prize history of mechanics that the simplest experiments which one makes himself have more value in the study of natural science than the complicated ones which one only sees. If one is compelled then to admit that he finds real systematic progress in all kind of schools through the performance of experiments by the pupils themselves, which are adapted to their needs (the so-called "inventive method" which has already been worked out

very well, especially in England and North America),¹ then still other reasons are given the *Seminar* as a professional school for requiring that theoretic instruction be supplemented by practical exercises in experimenting and in developing skill of hand. With reference to instruction in physics these reasons are discussed thoroughly by Dr. Pabst in a program of the *Seminar* at Cöthen which appeared in 1889, *Über den Physikunterricht im Lehrerseminar* (Concerning the Instruction of Physics in the *Seminar* for Teachers.) As is shown there, practical exercises in the simplest technique of physics (work in metals, glass, application of technical work in wood and other materials) are entirely indispensable for the future teacher. Whether we regard these exercises as instruction in natural science or assign them a special place under the name "educational handwork," is of no importance; their chief value lies far less in the requirement for the general purpose of instruction in natural science than in their significance in the systematic development of the members of the *Seminar*. They constitute a most essential condition for progress in all efforts which tend to give a true conception of the appearances of nature by means of the application of simple teaching material which is well adapted to instruction in classes.

What has been previously said with reference to instruction in the natural sciences also applies with certain modi-

¹ Cf. Dr. K. Fischer, *Der naturwissenschaftliche Unterricht in England* (Instruction in the Natural Sciences in England), Leipzig, B. G. Teubner, 1903; and Dr. A. Pabst, *Beobachtung und Experiment im naturwissenschaftlichen Unterricht* (Observation and Experiment in Instruction in the Natural Sciences), *Neue Bahnen* (New Paths), 1906, Number 1.

fications to the instruction of other branches in the *Seminar*. With the present arrangement of the curriculum, it is, to be sure, impossible that handwork in the *Seminar* should receive consideration corresponding to its significance, even if the objection, formerly frequently heard, that the introduction of instruction in handwork would lower the aims of culture of the *Seminar*, needed any refutation for the expert, who is acquainted with modern methods. But the voices are loud which point out the necessity of a thorough transformation of the institutions for the training of teachers, and at the same time point out an especially important task for instruction in handwork. Here again it is Hagmann who takes up the problem most thoroughly in his work which appeared recently, *Zur Frage der Lehrerbildung auf der Volksschulstufe* (Concerning the Problem of the Training of Teachers of the Rank of the *Volksschule*, St. Gall, 1905.) Instead of the former model school, in which the members of the *Seminar* could only obtain a small amount of school practice, he demands the connection of the *Seminar* with an orphans' institution, in which the workshop is a real necessity, for in the *Volksschule* of the future no phase of human activities will be fostered more zealously than those depending upon the skill of hand. The *Seminar* should increase the capacity for manual work. It should open a special workshop where the *Seminar* student is tested as to whether and how far he has the skill to take hold of things. And it would be a real test, for he who shows himself altogether incapable here scarcely has in him the stuff which makes a teacher of the *Volksschule*. In this roomy workshop we place the student with permission to work at the bench. Tools of all kinds lie ready, also

material in the way of paper, wood, clay, and metal to be worked up. It is supposed that the member of the *Seminar* will here acquire the ability which will entitle him later to supervise instruction in the handwork of the school; he also gains an insight into the extensive field of manufacture of the nation, but the most important result is that talents in the direction of skillfulness are unfolded which until now have remained latent in the people. And in fact, the high degree to which the future teacher of the *Volksschule* can arouse in the pupils the instinct for work can scarcely be estimated." (Page 34 folg. of the above-mentioned work.) This outlook into the future opens up, in fact, an immeasurable perspective. Instead of the educational method which we now have, a method which frequently hampers the productive energy instead of developing it, and which for the sake of a conception of general culture that is not based upon reason, injures the health of our youth and neglects the development of character, the essence of our education should bring about a real culture, that is, a development from within. Then would our people be prepared to solve the culture problems of the future. The introduction of the workshop into the school is the symbol of the changed method of education, which has been developing slowly but surely. Perhaps in a not far distant future the statement will be true: "Only he is truly a teacher who teaches the secret of work."

But before this perspective becomes complicated, it is probably appropriate to direct the attention once more to the present conditions and to characterize briefly the practical development which instruction in handwork has had in the *Seminar* up to the present time. Of the attempts,

partly successful and partly unsuccessful, which have been made in different places to carry on a technical branch of instruction with the voluntary participation of the pupils and under the guidance of whatever teacher happened to be at hand, we need not speak in detail. Such kinds of instruction in work are not only worthless in themselves, as has been shown by different articles which have been presented, but they cannot be recognized as efforts in the direction of a systematic and methodical development of instruction in work. An attempt of that kind presupposes, at the outset, a required course of instruction, but must at the same time fit naturally into the organization of the institution concerned. Such a plan was completely worked out at one time in the *Seminar* at Cöthen, which has already been mentioned, in which the author was active in the middle of the eighties in the organization of workshop instruction which would meet the needs of the *Seminar*. The necessity of something of the sort was impressed upon him by considerations which had their beginning in the systematic treatment of the branches of natural science. The practical instruction was, therefore, intended, first of all, to develop technical skill, which is required in teaching physics and the related subjects. To this class belongs primarily a certain technique in working up metals, glass, and other materials. This was carried on in the third class of the institution having six classes, with two lessons a week during the winter semester, but in such a way that each section of the class numbering about thirty pupils had only one hour of instruction. This instruction sufficed, with the aid of voluntary work, to complete the most necessary manual exercises which are required in the construction of simple equipment for teach-

ing the natural sciences and other branches. In the next higher class the making of such equipment was systematically carried on in a lesson once a week, but in such a way that the pupils were given a certain amount of scope in the choice of the equipment to be constructed. For since both talent and interest differ greatly in individuals with reference to technical accomplishments, the best opportunity is offered here for individualizing, and the more the talent and inclination of each student in the class are given an opportunity to develop, the greater will be the interest and the better will be the results. Among a large number of young people there are always to be found persons gifted in technique, whose achievements far surpass those of the others and who are on that account inspiring and original. In this there does not result, as is often the case in other branches, a rivalry which from a moral point of view is often not without objection, but rather an interest in the coöperation found in the work and in the mutual helpfulness in achievement. Certain processes always require assistance from a fellow student which is gladly given and received on both sides. Moreover, in this lies a valuable educative element, of which one can frankly say that it has a social significance. The social significance of practical instruction can not easily be too highly estimated, because it contributes more than any other branch of instruction to guide into right paths the desire of the youth for independence and freedom by unfolding his individual talents and inclinations in and by directing his interest to serious tasks. These awakened interests prevent a waste of his leisure time and still worse results if he were not thus guarded. For this reason also practical instruction in the *Seminare*, the pupils of

which live mostly in the boarding school, is of special importance.

But the chief value of practical work lies, as has been said before, in its significance for the systematic training of the members of the *Seminar*. The result of the instruction in work in the *Seminar* at Cöthen was also in this respect very soon noticed, and after the plan of organization described above had been maintained for several years, it lead to an extension of the instruction to all classes of the institution. For the three lower classes a practical, technical form of instruction in paper or pasteboard and work in wood (problems at the planing bench and carving) was introduced, by which the pupils were so far prepared that they could soon enter upon difficult problems in the middle classes. But the introduction to the pedagogy of the system of instruction in work was reserved for the upper classes. This did not stop with a general survey of the history and theory of the subject, but was directed particularly to the entrance upon the teaching of it. In this the practice school of the *Seminar* offered a fitting opportunity, and after instruction in handwork had been carried on in this school for two years with voluntary attendance of boys of both the upper classes, where favorable results were unmistakably seen, the instruction in 1898 was made obligatory for all classes of the practice school. The subjects of instruction worked out for the different classes correspond in general to those published by the German Society for Boys' Handwork, and consist of work in paper or pasteboard and wood, also the chip carving, while modeling received as yet no definite place, but was limited to experimental work in the different grades.

It would be going too far to follow in detail the further development of instruction in work in the *Seminar* above mentioned. Probably a later day will fully appreciate the services which the director of the *Seminar* at Anhalt, Privy Counsellor Rümelin, and Professor Blume, Director of the *Seminar*, have rendered in this respect. (Cf. the lecture delivered by Privy Counsellor Rümelin at the congress in Kiel in 1897, *Die Verbindung des Handfertigkeitunterrichts mit dem Lehrerseminar und mit der Volksschule*, The Connection of Instruction in Skill of the Hand with the *Seminar* for Teachers and with the *Volksschule*.) We cannot yet give a final opinion concerning the entire development up to the present time, but we cherish the hope that it will contribute essentially to the realization of significant ideas which underly instruction in work. This hope is the more firmly established since the instruction in the *Seminar* at Cöthen rests in the hands of one of our young teachers who has been thoroughly tested both as to theory and practice (Cf. in the *Blätter für Knabenhandarbeit* articles published by M. Mittag, Instructor in the *Seminar* at Cöthen.)

Unfavorable experiences, which have occurred in several places are just as instructive. When one is in a position to examine them more closely, he will nearly always discover that the failure has been caused by some special conditions; for example, by lack of time or of appropriate room and equipment, by unsatisfactory training or lack of interest on the part of the teacher, etc. On the whole, then, these experiences prove nothing against the thing itself; they only show how the success or failure of experiments in turning an idea into practice which has been regarded correct in theory, often depends upon peculiar cir-

cumstances. Here again the thought of Goethe is applicable:

*“Eines schickt sich nicht für alle!
Sehe jeder, wie er's treibe,
Sehe jeder, wo er bleibe,
Und wer steht, dass er nicht falle.”*¹

¹The same thing is not suitable for all. Let one watch how he ventures. Let another be careful where he remains, and he who stands that he may not fall.

CHAPTER V.

SYSTEMS AND PRACTICAL EXECUTION OF INSTRUCTION IN HANDWORK IN DIFFERENT COUNTRIES (SWED- ISH SLOYD, INSTRUCTION IN HANDWORK IN FRANCE, ENGLAND, NORTH AMERICA, AND JAPAN.)

The perfection of the theory of instruction in handwork went hand in hand with its extension into different countries. By this circumstance a fact is made clear which is important in the existence of education and culture in general; namely, that the character of its development depends upon the peculiarities of the nation concerned. Different nations have tried to solve in various ways the problem of instruction in handwork.

It was taken up, first of all, from a purely theoretic point of view, while the reasons for the necessity of instruction in handwork were sought in different departments of knowledge, and the possible forms of its practical execution were derived from pedagogical considerations. In general this course has also been followed in Germany.

Since Pestalozzi and Fröbel we have not lacked theoretical discussions concerning the necessity and kind of instruction in handwork, but only in individual cases has anyone decided to turn the theory into practice, and to determine by experiments in the schools of different kinds whether and how far instruction in work can be practically carried on. In other countries, on the other hand, numerous and comprehensive experiments of this kind have been

tried, and especially does the United States present an example of the development of instruction in work, based on practical experience. Of this more will be said later. But the theory has not been neglected there. Through the study of physiological psychology, which is carried on with great zeal, the theory has gained an accurate foundation. At the same time instruction in work, through its practical significance resulting from economic and technical conditions, is now favored by groups of people who perceive the best security for the progress of the whole nation in a development which accords with the spirit of the age. So here, as in other countries, the reasons given for the necessity of instruction in work, growing out of purely theoretical, pedagogical considerations, frequently coincide with the reasons derived from the practical necessities, and, on that account, it is, in general, by no means an easy task to keep these distinct lines of thought separate, and to follow the conclusions to their final and real foundations. It is here as in Nature: from a small seed grows the tree, which stands towering before us with a profusion of branches, foliage, and fruit. From many hidden, far-extending roots, it draws its nourishment; with wonderful circulation its sap rises from the soil, is assimilated by the sunlight, which streams over the forest of leaves, and is changed into different substances which the tree needs for its nourishment and for the formation of its fruit. And as a fruit tree gives out its far-reaching blessing, so does our tree of instruction in work bear rich fruit. The freer and less hindered it has been able to unfold in its growth, the more air and light it has received, and the more care it has had bestowed upon it, the more stately has it grown, and the richer is its fruitage now. And as trees grown

from seeds of the same kind often show an entirely different form and are very unlike in their fruit, so there have arisen out of the same pedagogical ideas, which led to the development of instruction in work in individual countries, different forms of the same thing, which at first glance scarcely appear similar.

To compare these different systems of instruction in work, to present them briefly in their development, and to go back to the simple, primitive forms which they have in common, shall be our further task.

Swedish sloyd rests upon an exceedingly definite system. The word "sloyd" means general skillfulness of the hand, in contrast with skillfulness in the way of a trade. The idea of sloyd can include handwork in wood, metal, paper or leather and it does not exclude braiding, weaving, and painting. However, the purpose of sloyd is never the industrial training, but always simply the development of the physical, spiritual, and moral powers of the child. Sloyd acts in an educative way; it calls into play independence, accuracy, diligence, and perseverance, upon which the character of the individual rests, and leads to respect for work, especially physical work. The models, the making of which forms the task of sloyd instruction, do not constitute the purpose of the instruction, but only the means to that end. These models might afterwards be destroyed, but the purpose of sloyd instruction would be injured as little as is the handwriting of a child by the destruction of the copy books which he has filled during a school year. By the use of tools and the adaptation of materials, the child acquires a degree of dexterity and knowledge which is useful in life, yet it is not even in this benefit that the chief value of sloyd instruction lies, for

the perfection of individual attainments by each pupil is not taken into consideration, and the knowledge gained will be forgotten by many without ever being put into practice. On the other hand, the development of the spiritual, moral, and physical powers is of lasting value, and upon this is based the significance of sloyd in education. In this respect it cannot be replaced by other studies of the school, and for this reason its general introduction should be demanded. The purpose of school education, which is the general development of the individual, is not injured by it. Sloyd is not a branch of technical training, it is not training for industry or a particular trade; its method must therefore be shaped accordingly; it must harmonize thoroughly with the principles of teaching, and the teacher who handles it should not fall behind the teachers of other branches of learning in pedagogical development. It is of greater importance that the child should learn to be observing and active, and that he should not wait till everything is explained to him. ✕The teacher is to show him nothing which he can find out through the exercise of his own powers; he is not to talk about the use of tools, but to use them, and the pupil is to observe how he uses them; he is to consider the position of the body and estimate the amount of strength which is necessary for the execution of a certain movement. ✕He is to examine with the eye the models from which he works, and learn to reproduce them in a drawing. The model, as a concrete object, forms the starting point; the drawing, as something abstract, comes later into use; and not until the children have reached the highest stage should they work from a drawing, or design a model themselves. To require the children at first merely to do exercise pieces would be

wrong from a pedagogical point of view, for preliminary exercises are nothing but abstractions, and there would be danger of losing the interest of the child through these wearisome exercises, thereby diminishing the pedagogical value of sloyd. For this reason the goal of sloyd instruction must always be the completion of a really useful object, for only in such an object does the child take an interest; preliminary exercises are admissible only in so far as they make possible further execution, and guard against the useless waste of material.

The system of instruction in handwork for boys which has been developed in France is, in many respects, in direct contrast to the system of Swedish sloyd, which has already been described. The French instruction in handwork does not serve directly as a preparation for a trade; it has, above everything else, an educative character and concerns itself with simple exercises which give the child a certain general skill of hand and development of the eye and of the practical sense. The foundation of all handwork is drawing; therefore, nothing shall be constructed which is not based upon a design drawn by the pupil. Drawing, geometry, and arithmetic are the branches of scientific instruction with which the practical teaching must be connected. Handwork assists the development of the child to a considerable extent; therefore, everything should be eliminated which might in any way suggest a trade.

In the effort to do this, the danger has not been avoided of bringing too much theory into the instruction in handwork; and this has been done, as a matter of course, at the expense of practical activity. Even for the first school year the plan includes not only simple exercises in folding

and weaving, but also an understanding of the meaning of horizontal, vertical, pointed and obtuse angles, a right angle, quadrangle, parallelogram, trapezium, cube, pyramid, etc.—certainly an excess of theoretical ideas which can in no case be justified. On the other hand, modeling is not given sufficient importance; only at a later stage is more attention paid to it, but even then it is developed in a one-sided way in the direction of geometric ornament by adorning rectangular clay blocks with geometric figures. Thus the French system, which is otherwise clearly planned and excellently worked out, can by no means be considered entirely free from objections. The concrete Swedish system of sloyd is, without doubt, to be preferred in the lower grades.

The French masters of method themselves soon recognized this weakness of their system and tried to remedy it by the introduction of objects of utility which are made along with the exercises for practice. An authority, at least on the system generally used in the elementary schools of Paris, is the handbook *Le Travail manuel à l'école primaire*, (Handwork in the Elementary Schools, Paris, Belin) by Jully and Rocheron, the two inspectors of instruction in handwork in the schools of Paris, who, moreover, in directing the courses for the training of teachers, exert a great influence. In general the instruction is based upon the following systematic principles: the tasks selected must be adapted to the physical powers of the child and must take into consideration the exigencies of the school. With the exercises for the eye, training in attention, intelligence, and development of taste are united. Therefore, those exercises are preferred which take into consideration drawing and which require the pupil to

analyze, estimate, measure, and work out geometric forms. Thus, instruction in handwork not only aids in the teaching of physics but assists essentially in the scientific instruction in drawing, geometry and arithmetic. The work of the first three school years is carried on in the class without the use of special workshops; from the fourth year on, handwork is conducted in pupils' workshops, (*Ateliers de travail manuel*) under the direction of a pedagogically trained master of handwork, who is given an assistant teacher. Sketches of the work have been previously discussed in the drawing lesson of the class and have been worked out in accordance with the rules of drawing. Every student possesses a special notebook in which each lesson is worked out on two pages according to the following scheme: first, the work (material, measuring, cutting, etc.); secondly, the result of the geometric observations (for example, a straight line as the shortest distance between two points); thirdly, the drawing of the object (geometric figure with diagonals, etc.); fourthly, the application (for example, after a discussion of horizontal and perpendicular lines a fence is drawn or a model is designed.) In the work of the shop the principal importance is attached to the handling of tools and to careful execution in the technique. The materials used are wood, iron, and clay. As a matter of course, during the six hours which are devoted to the work each week, at least two branches are carried on. The first exercises in wood begin with the square and forms derived from it. To these are added the equilateral triangle, the regular hexagon, and the octagon; later joints are made and are used in the construction of objects. As typical objects which are made in the first year's work may be mentioned,

for example, a cross (*croisillon*), a yarn winder, a panel, a frame, a paper knife, and a letter holder; in the second year are added a clothes rack, ink stand, back for a thermometer, little chest, etc. The first construction in iron is made of thin wire, which is worked up into pleasing forms of adornment. Then thin sheet iron is made into rosettes and ornamental forms by means of the file and hammer; napkin rings, match-holders, square, letter scales, etc., are objects which are made in the next higher grade. All the exercises as well as the use of the individual tools are carefully graded according to the technical difficulties involved, and in each workshop are hung on rectangular wooden boards the complete course of instruction arranged in a pleasing form, according to the months and years, so that wherever one is he can gain an insight into the progressive steps in the work. In the year 1900 one hundred and thirty-five elementary schools in the city of Paris were provided with a completely equipped workshop, while a number of schools possessed still more extensive equipment; the total cost for the instruction in handwork amounted to 346,300 francs (\$69,260). More complete equipment is found, especially in the upper elementary schools, which are attended by pupils of fourteen to twenty years of age; the equipment of the workshops as well as the kind of work has a direct bearing upon the future vocation of the pupils. In the trade and apprentice schools this specialization is naturally more sharply drawn, a necessity which with the high standing of industrial development in Paris is never overlooked. There is no doubt that the compulsory introduction into the French elementary schools of instruction in handwork, which has been in force since the legislation of 1883, has resulted

not only in a clear perception of and strong emphasis upon the general educational and pedagogical significance of this instruction, but also in consideration for its importance in industrial training.

The place which has been assigned to handwork for boys in the English council school and the position which has been given to it as a branch of learning, can only be correctly understood in connection with the peculiar arrangement of the English council school. It amounts essentially to this, that the state keeps up no school itself, but simply grants appropriations, the amount of which depends upon the kind of school, the branches to be taught, and the number of pupils. On the other hand, the state does not even prescribe a program of instruction for the schools, but leaves the arrangement of it to the local conditions. Only reading, writing, arithmetic, and drawing up to a certain stage are made by legislation required studies; the elementary exercises for the lower grades in handwork (hand and eye training) and also the instruction in handwork for the upper grades (manual training) belong to the optional subjects of instruction. The participation in these and also the care which is bestowed upon them by the school is essentially dependent upon the appropriations of money which the state devotes to it. Since handwork for boys has been included among the subjects of instruction which are provided with appropriations (in 1890), a rapid and constantly growing acceptance of the new branch of instruction has taken place. The appropriations are subject to great variations and local differences, amounting probably in the most favorable cases to about \$2.50 for each pupil of the upper classes, so that if one hundred boys enroll for instruction in

handwork, the school will be provided with \$250. For the lower grades the appropriation is essentially smaller, about seven and a half cents a year.

As the "children's classes" (*classes enfantines*) of the French elementary school offer a course preparatory to the first real school class, so the infant school in the English council school is provided with a preliminary course which fits in an excellent way for the instruction in handwork which comes later. The infant schools are organized throughout according to the principles of Fröbel, and consider it their task both to develop the talents and powers of the child in a fitting way, and to take into consideration especially a good physical development. The organs of sense are stimulated and the childish inclination for activity aroused. In accomplishing this purpose many exercises of the system of Fröbel are extensively utilized; plaiting, folding, sewing, knitting, stick laying, stringing beads, laying strings, and exercises in distinguishing forms and colors alternate with drill in language, playing, and singing; modeling in clay and plasticine as well as drawing, plays an important part. Even the rich material equipment of the rooms for instruction—utensils and blackboards, etc., indicate that abundant opportunity is given the childish instinct for development through activity. An insight into the curricula of these schools is exceedingly instructive. Just as handwork in the infant school is based upon a carefully thought out and systematic, progressive system, so is the "hand and eye training" which is carried on in the elementary and intermediate classes of the council school.

It concerns itself, first of all, with the development of the power of observation and with the transmission of the

first conceptions of space and number, on the basis of self-activity and in connection with object teaching. In this connection, the development of the hand receives due consideration and, of course, modeling in clay, cutting in paper and cardboard, drawing, coloring, and brush drawing are pursued. In many respects handwork is also brought into relation with theoretical instruction. In this, modeling offers, on the whole, abundant opportunity. For example, the pupils make a model of the course of a river or use modeling in the instruction of physics or drawing. Brush drawing is employed as an excellent exercise for the comprehension of form and the development of a feeling for color, and problems in cardboard are assigned with reference to mensuration. In many places where the system of "hand and eye training" has been completely carried out it has generally been extended through the first four school years, while the real manual training has been reserved for the three upper classes as in the higher grade schools. This is the case particularly in the board schools of the large industrial cities, but the schools of smaller places also are frequently arranged for it. The instruction is in general imparted by a class teacher and in classrooms; in the larger classes, as a rule, in addition to the main teacher, an assistant teacher or pupil teacher is employed. The school authorities have issued carefully worked out, systematic directions, by which the teachers are led to an efficient handling of the instruction; they lay special stress upon the consideration of general educational principles, while they leave much freedom in the details of the execution. The pupils who have passed through the "hand and eye training" naturally enter upon the actual instruction of the workshop of the

upper classes under much more favorable conditions than those who have not had that kind of preparation. In the school workshops woodwork is mainly carried on; and, as a matter of course, in larger cities, for the sake of economy, so-called "centers" have been established, which are used by several schools. (London, for example, in 1902 had one hundred seventy, Leeds sixteen, and Glasgow eleven such centers.) The buildings in which the workshops are located resemble on the exterior our *Turnhallen*; in many cases they also contain, in the advanced schools, in an upper story, rooms for instruction in the natural sciences. The workshops are so arranged that several classes can work in the same room or in adjoining rooms at the same time; they are well equipped with all kinds of material for object teaching, collections of different kinds of wood, models, etc. The courses of instruction are arranged so as to bring the pupil to the handling of the most important tools and to an understanding of useful forms of construction. Frequently in the lower grades of this work only practice pieces are made; every piece of work is based upon a drawing of it which has been made by the pupil. The instruction is carried on in classes, but in such a way that the talented pupil shall not be held back on account of the untalented one, this practice being carefully observed in the English system of education. Even with reference to the prescribed courses of instruction much freedom is granted the individual schools. In the higher schools in which instruction in handwork is also extensively carried on, it is frequently made to serve other subjects of instruction, being employed, for example, to make apparatus and instruments which are used in the instruction of the natural sciences and mathematics. [The teach-

ers of manual training are mostly special teachers who have received their training in special courses. In conducting the instruction, the deportment and zeal of the pupils are usually all that one could wish. In the larger cities special inspectors are appointed for the organization and oversight of the instruction. Centers for metalwork are generally provided only for the higher schools; in large factory cities, on the other hand, in which metal industries predominate, metalwork takes a more prominent place in the school workshop. It is also worthy of notice that many of the evening schools intended for voluntary attendance are equipped for shopwork. The work in these schools, as a matter of course, is of an industrial character and exerts a great influence in the industrial development of the growing youth. A strong accentuation of all practical instruction is, on the whole, characteristic of the entire English system of education and culture; this is also true of the educational institutions for girls and women, in which practical activities—housekeeping, cooking, making clothes, etc., enjoy a much greater popularity and appreciation than with us in Germany. The judgments which are pronounced by the inspectors and leading schoolmen concerning instruction in work in the compass of the entire system of education is also in general very favorable. The report of the school authorities of Birmingham in 1896 states: "The reproach, which until now has been made against the method of the elementary school that (in teaching handwork) it was in a one-sided way pursuing simply theory, has no longer any foundation. But, on the other hand, the theoretic instruction does not suffer. It seems as if the limited time for instruction is compensated by a clearer comprehension, which is gained

by the united activity of eye, hand, and intellect. I am convinced that practical handwork exercises a distinct effect upon the whole system of the school. It helps in raising the intelligence of the school children." In harmony with this report, it is also emphasized in a further report by the president of the school authorities that a complete alteration in the attitude of the teachers toward instruction in handwork had taken place and that it has become a favorite study both of pupils and teachers. Besides, the president was not satisfied with these expressions from schoolmen but also collected evidence from a number of manufacturers and tradesmen of the city of Birmingham whom he gave the opportunity of thoroughly testing the instruction. The purport of their opinion was that they regarded the new branch of instruction as a very valuable part of the training of the elementary school. (H. Bendel, *Der Handfertigkeitsunterricht in Englischen Volksschulen*. Instruction in Handwork in English Council Schools, Zürich, 1901.)

As has been previously indicated at different times, the efforts for the advancement of instruction in work can be traced back essentially to two main tendencies. The one, which is determined by the demands of life and by the necessity of guiding the individual efforts in the direction of industry and technique, might be called the practical. The other has its source in the province of pure pedagogy and is based upon the knowledge that development of the intellect of the child is only made possible by independence and by the use of the elements of culture which are accessible to him—in reality then by the simplest technical work. This second tendency, which urges the acceptance of technical work as an indispensable factor in education,

is called the pedagogical. Both tendencies are represented in the systems of education of the different European nations, but nowhere do they exist side by side in such distinct form as in the system of education of the Americans.

A glance at the cultural development of the American people makes it possible to understand this, for if the statement is in general true that the national characteristics of a people are mirrored in its system of education, this is especially true of the American people, whose cultural and national development has proceeded in a characteristic way, essentially different from the development of the peoples of Europe. First of all, the high estimate of the value of technique and its extensive application for all purposes and ends is characteristic of America. Along with that, is found a high appreciation of the technologist and the need of developing technical powers, which has exerted a decided influence upon the system of training. Thus it can be understood how the manual training high school was developed. This school is thoroughly characteristic of the American system of education and for it scarcely a parallel can be found in Europe. The organization of this type of school cannot be comprehended without further explanation; especially is one liable to fall into the temptation of looking upon it as a kind of industrial or trade school, since we are apt to confuse it, in the first place, with such schools on account of its peculiar workshop instruction. But the American insists that these schools shall be institutions of general culture and that they shall take up and foster shopwork only as an element of general culture. They are connected with the common school, and supplement the eight-year course of training

with a four-year course of study which includes, as a rule, six parallel branches; namely, mathematics, natural science, the English language, history or foreign language, drawing, and shopwork. About a quarter of the entire time of instruction is devoted to shopwork; in the upper classes almost a third of the time. It includes chiefly work in wood and metal done in workshops, which are fitted up on a large scale and equipped with machinery. The pupils of the upper classes are instructed in the elements of the construction of machinery. In many schools the construction of patterns for the metal castings and the pouring of the metal itself find a place in the curriculum. The connection of handwork with drawing is preserved in all the grades; and, whenever suitable teachers can be secured, the handwork is turned in the direction of artistic development, while modeling especially is fostered and is connected with forms of technique which prepare for artistic work—pottery, wood-carving, metalwork, chasing, engraving, book printing, photography, etc. From these suggestions it can be seen that the manual training high schools are arranged quite differently with regard to organization and curriculum. This can be explained thru their extensive application to local needs and thru personal influence, which in the American system of education may be exceedingly effective, since there is no central control and great scope is left to the individual states and cities in the organization of the schools. In the organization of the manual training high school the future technical calling of the pupils is especially taken into consideration; the tendency arising in the technical colleges of making them actual preparatory schools for the latter is recently very marked. But they are still, first of all, institutions which serve

general culture, and from them the pupil can find his way to some practical calling or to a literary pursuit. It is also contradictory to the American fundamental conception of a system of education to have a road of training lead into a blind alley. It seems to him that the best kind of training for a young person is that which makes possible an entrance into the different relations of life and the different kinds of calling without laying down from the very beginning a definite direction which must be followed. In this comprehension of the term lies the explanation of the great popularity of the manual training schools, the number of which has risen in a little more than twenty years to almost two hundred and fifty; for their equipment nearly every large city is glad to make a considerable sacrifice. The sums which are expended for it are so large that such willingness for sacrifice can, in fact, be understood only by comprehending the high estimate of technique and thorough insight into the value of the technical in education which exists among the whole people. We should like to say frankly that the ideal of training held by the American people is a "modern-technical" one, and not, as with us, the "classic-historic" one. So it is not surprising that one often has the impression, even on looking into the schools, that the essential purpose is to build up a people of technicians.

But, as has been said before, the stimulus for placing great stress upon the importance of instruction in handwork in education has arisen in another quarter, namely, in the knowledge of pedagogy and psychology. It is known that psychology is fostered in America very zealously. But the study of psychology has shown the significance of the activity of the hand in the development

of the brain, and the practical art of education has followed up the results of this knowledge and has built upon its foundation a new system of education. We, who are bound by strong tradition, do not at present dare to disturb the forms of instruction which have been handed down, even though we may admit that they are based, to some extent, upon unstable foundations. The Americans have boldly taken the first step and have founded schools in which manual activity forms the central point of all school work and the starting point of all instruction. One of the main advocates of the pedagogical tendency which now comes up for consideration is John Dewey, formerly active at the University of Chicago, where he founded and directed the School of Education. For the past two years he has been effective in the Teachers College which is connected with Columbia University in New York City, and in the experiment and practice school of this great institution, the Horace Mann School. The main ideas of his system of education have been embodied by him in different works, among which the lectures on the theme, *School and Society*, have appeared in a German translation by E. Gurlitt (Berlin, Walther's Publication, 1905.) It is characteristic that Dewey renounces all the pedagogical theories which are our standards as something fundamentally worn out; of the German pedagogues he mentions only Fröbel, and, like the latter, he builds up his system of education upon the activity of the child. The school of former times treated the child as if he were "in the first place a listening creature." Mere passivity, however, is not natural to him, but activity. Dewey gives four instincts which the school must not suppress, but develop: the communicative instinct, the instinct for investigation,

the constructive instinct, and the art instinct. While the former school began with reading, writing, and arithmetic, thus with accomplishments which were, first of all without interest for the child, we must on the contrary begin with creative activities and repeat with the child the course of humanity. As humanity begins its life with the procuring of nourishment and clothing, so must the child begin with the knowledge of the plants which give us nourishment and clothing and with the explanation of the processes of work which belong to them, cooking, spinning, and weaving. With this work the foundation is laid for history as well as for the natural sciences, for "the entire history of humanity can be comprised in the course of development which the fibers of flax, cotton, and wool undergo." As children in their play turn back wholly of their own accord to the technique of primitive times in building huts and imitating the hunt with bow and arrow, so the foundation for history and natural science must be laid by means of technical work. Only in this way can the school foster the activities which have previously been mentioned and become a real place of education. The technical work in wood and metal, weaving, sewing, and cooking must become a part of the plan of education as if they constituted the purpose of life and were not simply assigned branches of study instruction. They must be a means thru which the school itself is made a natural part of the whole life, while it is now only a place lying at one side in which one only has his lessons to learn. If our education is to be of any significance whatever in our life, it must go through as radical a transformation as that which our social life has experienced. This transformation is even now in progress, and

the new arrangements in our school activities are signs and proofs of a development of this kind. If we make our school a community on a small scale in which the individual members are engaged in practical work and are equipped with the spirit of obedience and the strength of self-mastery, then the best guarantees are given for a better future for humanity.

These are, in brief, the fundamental ideas upon which the system of education of Dewey is built. The practical carrying out of this system in the School of Education at Chicago has led to a rapid development of this school, and the reputation which it has gained, attended as it is by children of the best families, speaks for the good results of its activity.

Education begins in the kindergarten and in the lower grades lays special stress upon introducing the children to the forms of "primitive life," in order to make clear to them how humanity has progressed from that stage to the high stage of civilization of the present. The relationship which exists between the life of the child, and the life in the childhood of humanity becomes clear to the consciousness of the child and leads to an active interest in the development of the culture of humanity. The younger children begin with the activities in the home, while the higher grades are instructed in the industries which are carried on outside of the home, and in the larger social activities such as farming, forestry, and manufacturing. Accordingly, the handwork develops in three directions: first, activities connected with the preparation of means of nourishment; secondly, activities in the workshop; thirdly, activities with textiles, sewing and weaving. By means of all these activities the child exercises his organs

of sense, the eye and the hand, and becomes accustomed to order, diligence, and carefulness. The memory and the power of reason are trained, since the child must learn to do things in systematic order. Through the activity of cooking, chemical knowledge is acquired; the shopwork leads up to geometric principles and to the handling of numbers; and the theoretical work, which is connected with sewing and weaving, leads to geography. The exercises which are connected with the contemplation of "primitive life" lead to history and to the discussion of social life. The pursuit of natural science leads to an understanding of the forces of nature and their application in the service of humanity; the construction of castles and clocks forms the starting point of mechanics; the understanding of the telegraph and the telephone, the starting point of electricity.

Concerning the justification of this plan of instruction, which, as will be admitted without further discussion, has had its predecessors in German scientific pedagogy, (Ziller, Rein, and O. W. Beyer), further discussion will not be added. For our purpose the fact suffices that the Horace Mann School in New York also works with equally favorable results according to a curriculum which is based upon the same principles. This school, like the School of Education in Chicago, is also abundantly equipped with means of instruction and workshops. We find there, for example, complete tableaux for the "primitive life," houses built of stone and earth, representations of the simplest forms of agriculture and the relations of man to animal and plant. Models of mills, locks, and contrivances for intercourse and transportation are made of the simplest material by the children of different ages;

vessels of clay are first constructed simply with the hand and later with the aid of a potter's wheel and painted from a model according to nature; thus the relation between drawing and art is established. Work in wool and cotton leads to the textile industry; the preparation of food, which begins in the fifth school year with exercises in cooking of the simplest kind, leads to chemistry, and the observation and culture of plants and animals leads to biology. Instruction in art begins in the lowest grade with drawings from nature and with modeling of simple objects; and since handwork and art here as well as in most of the American schools are regarded simply as belonging together, it is worth while giving space to the complete curriculum of the seven classes of the elementary school.

The curriculum prescribes the following:

First Grade—

Handwork: Construction of numerous objects which are related to the hunting and fishing stage of the primitive life.

Art: Painting from nature branches of flowers, etc.; studies in color; modeling of fruits, animals, and simple vessels. Drawing and sketching of man and animal from life, on the blackboard and with the brush. Rendering of atmosphere, in a childish way. Study of pictures.

Second Grade—

Handwork: Construction of numerous objects which represent the development of the activities of the pastoral stage of primitive life. Work with reference to nature study.

Art: Drawing of branches, flowers, etc. Modeling and drawing from scenes in the pastoral stage. Study of

color. Proportions. Representations of the activities and simple positions of animals and men. Simple outlines and studies of pictures.

Third Grade—

Handwork: Construction of objects for the demonstration of the activities in the stage of the simplest commerce and discoveries. Life in Manhattan, for example, ships and Dutch houses. (Manhattan was the Indian settlement near which the Dutch established their first colony in 1624.)

Art: Study of flowers, seed pods, etc. Sketches from life (man and animal) with color and pen and ink. Simple, well-shaped flowers, drawing and modeling. Study of the time of the Vikings and knights. Dutch life, costumes, etc. Study of pictures.

Fourth Grade—

Handwork: The curriculum is differentiated; the work concerns itself with the domestic activities of the colonial period.

Art: Drawing and painting in connection with nature study—trees, blossoms, and fruits. Sketching in color and charcoal. Construction and decorative designs for pottery and weaving. Study of pictures.

Fifth Grade—

Handwork: Transition from domestic industry to industrial art with regard for present social needs.

Art: Nature studies in grouping of branches with a background. Scale of colors. Constructive and decorative designs from Greek vases and lamps which are modeled in clay. Study of pictures.

Sixth Grade—

Handwork: Sewing for girls; work in house building for boys. Mechanical elements preparatory to the stage of factory activity.

Art: Continuation of drawing, painting, and modeling. Scale of colors and their application in designs. Study of pictures.

Seventh Grade—

Handwork: Cooking for the girls; for the boys, introduction into industrial activity by means of designs in wood made from drawings. Models of means of transportation—carriage, railroad, ship, elevator, etc.

Art: Continuation of drawing, painting, and modeling. Scale of colors. Designs. Study of objects of nature and landscapes with reference to colonial life. Study of pictures.

If the foregoing plan indicates how extensively handwork is fostered in connection with drawing in a private school, it will be shown further that the public school is achieving remarkable results in this direction.

In New York I had the opportunity of seeing an exhibition of the results of the instruction in drawing and handwork which included selected typical examples of the work which had been done during the previous year by the boys and girls of the different public schools of the city. From it a fairly complete picture could be formed of the achievement of these branches of instruction.

Handwork begins in the first school years with exercises in paper and cardboard which are connected with the Fröbel work previously accomplished in the kindergarten, and with instruction in reading and other branches, especially object teaching. It consists of simple exercises

in cutting, folding, and pasting, all of which are done in different materials; in these activities especial care is taken in using suitable colors together. This work nearly corresponds to that which we designate in our German courses of study as "work of the preliminary stage."

Immediately following the work in paper and cardboard comes that in pasteboard, which is carried on from the fifth to the eighth school year in those schools which have no special workshop. At the International Congress of Drawing Teachers in Bern in 1904 this work in pasteboard from the public schools of New York attracted the attention of competent judges. They noted not only the original forms employed but also the tasteful combinations of colors and the thorough adaptation of the ornament to the material.

Another department consists of problems in wood which are constructed at the planing bench, and consequently can only be carried on in those schools in which there is the equipment for it. In the public schools of New York, in so far as the conditions mentioned are fulfilled, such work is carried on from the sixth grade up, but only by boys, the girls being given instruction in housekeeping. Elsewhere the girls are permitted to take part in the woodwork, just as boys are allowed to take part in the cooking.

The work at the planing bench is carried on in close connection with the instruction in drawing in the public schools of New York; an hour and a half each week is devoted to the actual shopwork. Of the objects which are made, for example, clock stands, serving boards, post card holders, book racks, and the like, the fundamental forms are given, but the individual development of those fundamental forms is left to the pupil.

Several schools had worked out simple problems in metal, small ornamental objects, and especially small problems in iron. Even here the forms had been happily selected and the technique was in all its simplicity solid and substantial.

A system of instruction in handwork similar to that of the public schools of New York which has just been characterized is found in other cities of the United States; in Boston, for example, the public school system of which shows an especially high development, the instruction in handwork begins likewise in the kindergarten with the Fröbel problems and continues through all the school years.

The woodwork of the upper grades is carried on in Boston only by the boys, while the girls receive instruction in cooking and housekeeping. Forty-seven public schools of the city are equipped with special workshops for woodwork and are used by several neighboring schools.

The entire system of handwork of the city is under the direction of a supervisor, to whom the special teachers and their assistants are responsible.

Even in the evening schools, where the attendance is voluntary, manual training has recently been introduced along with instruction in domestic economy, so that the growing youth is given an opportunity even beyond the school time to be trained in shopwork.

The systems in accordance with which this work is carried on are, on the whole, very different; of the foreign influences one often recognizes that of Swedish sloyd, and also, to some extent that of the German instruction in handwork. The principal stress is placed almost entirely upon woodwork, while metalwork and modeling are not everywhere pursued.

We have yet to mention a kind of handwork which has a large field in the American schools and is probably carried to the degree of an artistic accomplishment which far exceeds that which is found elsewhere in this connection. It is the so-called "basketry," work in weaving in different materials. This is not only carried on with great zeal in the very popular vacation schools—in all large cities such vacation schools are kept up during the long summer vacation from July to September—but has also frequently found a place in the regular work of instruction. It is evident that this work can be very valuable in the development of the artistic taste with reference to form and color; besides, one must say in praise of such work that it offers especially good exercise for the hand, because the left hand also takes part in it. That it is further adapted to arouse the interest of the pupils is best shown by the answer of a pupil of a seminary in Brooklyn, an intelligent young girl, whom I asked if they derived pleasure from this work. She replied, "The best time we have the whole week!"

The high development of basketry is evidently connected with the old artistic accomplishments of the Indians in whose domestic industry such work even today plays an important part.

With a correct understanding of the economic significance of this native industry, the American government offers it every possible encouragement; it has provided in the Indian reservations special schools for this purpose, as particularly in the education of the colored races (Indians and negroes) handwork is used to the greatest extent. The education of the colored races, especially that of the negroes, is for the United States an exceedingly difficult problem,

in the solution of which instruction in handwork for people of all ages is found to be one of the most effective means. In the large institutions which have been founded for the purpose of educating the colored races it plays, therefore, the chief role; for example, in the school at Tuskegee, conducted by the intellectual leader of the negroes, Booker T. Washington, in which technical work is carried on in all its forms, from the roughest work in the field and in the workshop to the finest work in book printing establishment, mechanical workshops, etc. The results of this education in work, in which, as a matter of course, the female sex also has an interest, are exceedingly favorable. Booker T. Washington himself has published an interesting little book concerning it under the title, "The Fruits of Industrial Training."

It is noticeable that the American, who is more than anything else a person of will, and who endeavors also thruout his education to work especially upon the will, places so high a value upon technical work as a means of education. Evidently he has in this respect, with his practical sense and insight, which are characteristic of him, recognized the correct thing and fixed his eyes upon its execution from the very beginning. The theoretical establishment of the indispensability of handwork in the system of education, which is encouraged in almost no country as in America, comes about there in response to an instinctive predilection for handwork, and has not been compelled to overcome first the difficulties and prejudices which in Germany, for instance, are opposed to the deeper pedagogical insight.

The example set by the United States cannot fail to exert an influence upon other countries in placing strong

emphasis upon technical instruction for the purpose of education. In the educational exhibit at St. Louis this influence was very marked, for example, in the case of Cuba, the system of education of which has been rapidly improved under American supervision. The countries of South America have been more dependent upon European influences in their development, if we can judge from their educational exhibits; Brazil, for example, shows unmistakably the influence of Germany, while Argentine Republic works in accordance with the Swedish system. In any case, there was visible in these countries a noticeable cultivation of instruction in handwork for boys and girls. This is also true of India, where naturally the work is carried on according to the English system, and, above all, of Japan, the exhibit of which attracted attention because of its copiousness, excellent arrangement, and systematic perfection.

Public education in Japan begins with the kindergarten, utilizing all the activities which correspond to the age of the child in an excellent, thorough manner. The complete exhibit of the elementary school, which is connected with it, showed, in addition to a large number of pieces of handwork, also very charming drawings, which were done on the finest silk paper and stitched together in an elegant way. In connection with this exhibit was that of the higher schools, of which the Royal Technical School in Tokio especially exhibited excellent, artistic handwork in wood, metal, ivory, ceramics, etc. The exhibit of the higher *Seminar* for teachers in Tokio gave the best survey of the system of instruction in handwork of Japan. This contained, on more than twenty tables, several hundred models, which illustrated in an excellent

way the instruction in handwork of this school of four classes. It begins in the first school year with two lessons a week and is followed later by three lessons. In all the grades it is closely connected with drawing and technique in the application of colors. The instruction begins with the simplest problems with sticks and strings, succeeded by work with bamboo and wood. Later, paper and pasteboard, tin and iron are used, and modeling receives careful attention.

The perfection of the Japanese system of instruction in work, which was brought to light in the Exposition at St. Louis and which was noticed even in the educational exhibit at Paris in 1900, in which the northern countries (Sweden, Russia, and Denmark) were very prominent, is in perfect harmony with that which we have learned from other sources concerning the educational system of the people of culture of the Far East. Even in the year 1894 it was reported, for example, that Japan possessed two hundred technical schools. If, in connection with this fact, we take into consideration that the Japanese have adopted the best ideas and educational methods of Europe and have known how to use them to advantage, this fact is not altogether surprising. The study of a very interesting collection of pieces of handwork done in Japanese boys' schools, which is in the possession of Prof. Richards of Teachers College, New York, led me rather to another opinion; that is, that the Japanese instruction in handwork has experienced a tolerably independent development. The superiority of Japan, which is now generally recognized in almost every province of industrial art, at least in so far as it depends upon handwork, only goes to establish this opinion. At all events, it is

interesting that the Japanese in the technique of metals use certain model forms and methods of work which are almost exactly like ours; the similarity of the Japanese technique with that which we practice, for example, in Leipsic, is decidedly surprising, and yet, according to all appearances, there is no external connection between our Leipsic system and the Japanese.

It is then only a matter of confirming the general law that every pure form of technique must be adapted to its material, and this law naturally holds good for Japan just as well as for Germany.

The thought, that instruction in handwork shows a development which is not limited to any one country or people but is accomplished among the different peoples of the earth along parallel lines and points to a definite goal, expresses a general truth, and can be made a generalization. As the idea of instruction in work has been foreseen by the great educators of different peoples, and as it has spread at the present time from Finland to South America, from Scotland to Japan and Australia, so it will also in the future gain a place in the system of education of all peoples.

Transitory drawbacks, which may for different reasons temporarily hinder, to a greater or less extent, the spread of the idea, will never be able to suppress or destroy it entirely. Such appearances are seen in the spread of all moral, political, and social ideas; they correspond thoroughly to the general laws of intellectual development, for every curve of development has its rise and fall.

He who desires the most favorable development of the German people for the future will have to wish that its education shall be an education for work and thru work.

PLATES

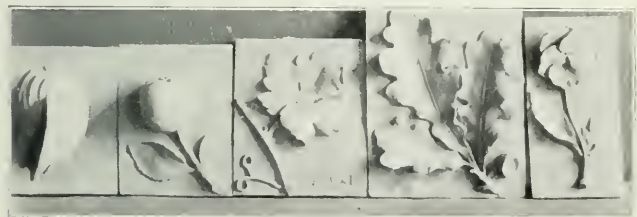
ILLUSTRATING TYPES OF HANDWORK AND
EQUIPMENT FOR HANDWORK.



I. BOYS AT WOODWORK IN THE TEACHERS' TRAINING SCHOOL, LEIPSIK.



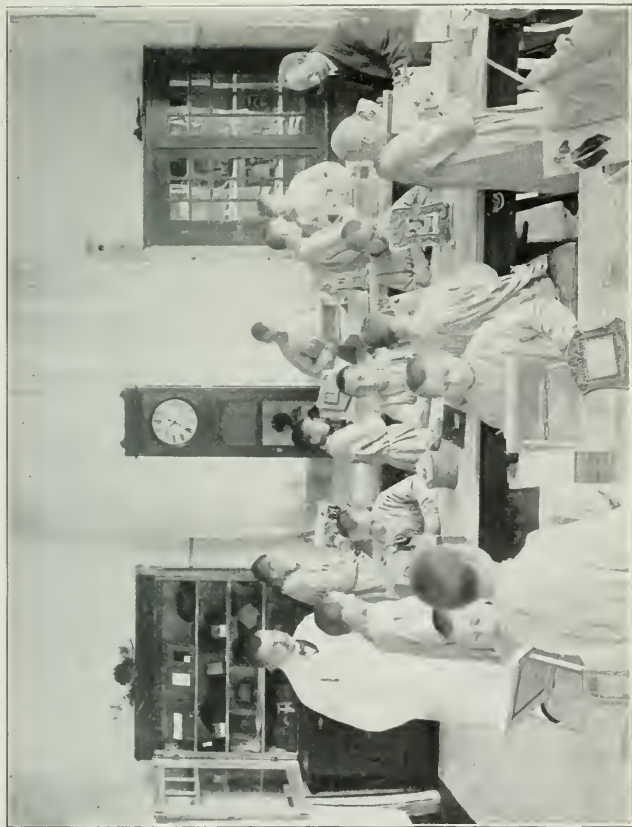
II. MODELS FOR BENCHWORK IN PLANING AND CARVING, TEACHERS' TRAINING SCHOOL, LEIPSIK.



III. MODELING, TEACHERS' TRAINING SCHOOL, LEIPSIK.



IV. WORKROOM IN A SCHOOL FOR HANDWORK, HILDESHEIM.



V. FEEBLE-MINDED PUPILS AT HANDWORK. INSTITUTION FOR THE FEEBLE-MINDED AT POTSDAM.



VI. CLASS IN SLOYD AT GOTHENBURG, SWEDEN.



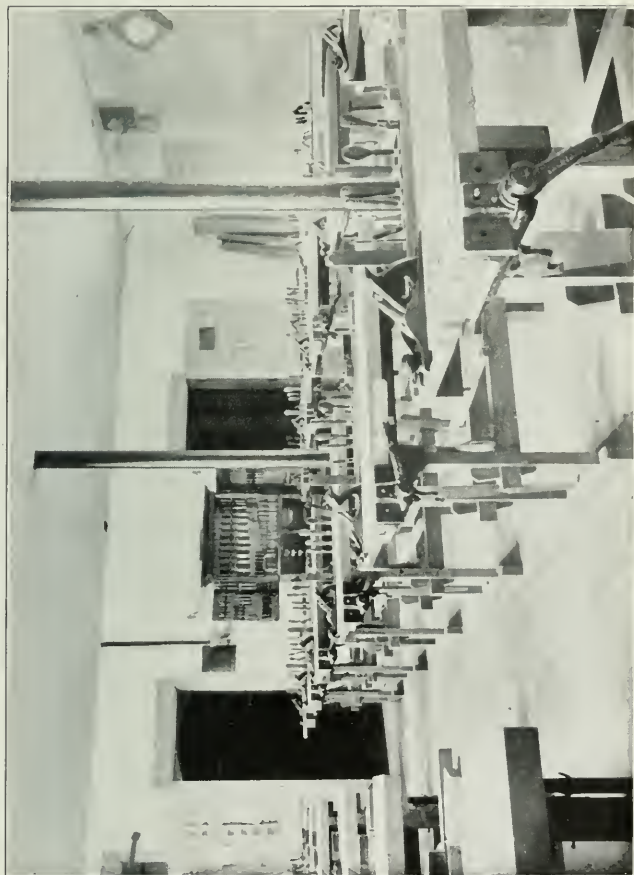
VII. CLASS IN SLOYD AT FREDERICKSHAVN, DENMARK.



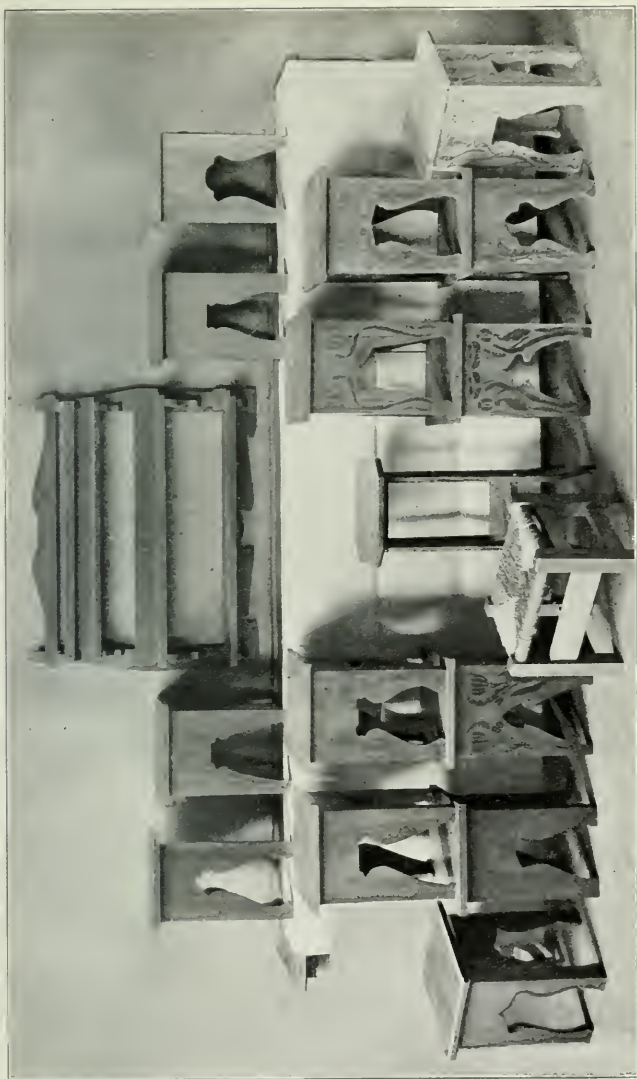
VIII. MANUAL TRAINING CENTER IN GLASGOW, SCOTLAND.



IX. CLASS IN SLOYD IN AN ELEMENTARY SCHOOL IN ABERDEEN, SCOTLAND.



X. CHESTNUT STREET SCHOOL SHOP, SPRINGFIELD, MASSACHUSETTS.



XI. TABOURETS AND PLATE RACK DESIGNED IN GRADE VIII, SPRINGFIELD, MASSACHUSETTS.

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